EXAMINING THE THREATS TO THE NORTH ATLANTIC RIGHT WHALE

OVERSIGHT HEARING

BEFORE THE

SUBCOMMITTEE ON WATER, OCEANS, AND WILDLIFE

OF THE

COMMITTEE ON NATURAL RESOURCES
U.S. HOUSE OF REPRESENTATIVES

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CONTENTS

OVERSIGHT HEARING ON EXAMINING THE THREATS TO THE NORTH ATLANTIC RIGHT WHALE

Thursday, March 7, 2019
U.S. House of Representatives
Subcommittee on Water, Oceans, and Wildlife
Committee on Natural Resources
Washington, DC

The Subcommittee met, pursuant to notice, at 10:01 a.m., in room 1324, Longworth House Office Building, Hon. Jared Huffman [Chairman of the Subcommittee] presiding.

Present: Representatives Huffman, Sablan, Van Drew, Lowenthal, Cox, Neguse, Levin, Cunningham, Grijalva (ex officio); McClintock, Lamborn, Hice, Webster, Johnson, González-Colón, and Fulcher.

Also present: Representatives Beyer, Moulton, and Keating.

Mr. HUFFMAN. Good morning, everyone. Welcome to this hearing of the Subcommittee on Water, Oceans, and Wildlife. We will now come to order. Under Committee Rule 4(f), any oral opening statements in this hearing are limited to the Chairman, the Ranking Member, the Vice Chair, and the Vice Ranking Member. This will allow us to hear from our witnesses sooner and help Members keep their schedules.

Therefore, I ask unanimous consent that all other Members' opening statements be made part of the hearing record if they are submitted to the Clerk by 5 p.m. today, or the close of the hearing, whichever comes first.

Hearing no objection, it is so ordered.

STATEMENT OF THE HON. JARED HUFFMAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. HUFFMAN. Thanks, everyone, for joining us for this important hearing to examine the many threats facing one of the most endangered marine mammals in the world, the North Atlantic right whale.

There are less than 420 right whales remaining. That is fewer right whales in existence than Members of Congress. If more is not done to save this iconic species, scientists predict it will go extinct in the next few decades.

According to NOAA Fisheries, in order to maintain a sustainable right whale population, no more than one right whale per year can be killed by human causes. And as Dr. Kraus has pointed out in his written testimony, that number has been exceeded every single year for the last 20 years. No wonder these whales are in such dire straits.

In 2017, they had a particularly bad year. There were 17 deaths and no new calves. While we have seen positive news recently,

including seven new calves spotted this year, there are ongoing threats, including fishing gear entanglements and accidental ship strikes. And additionally, the science shows that climate change may be shifting their food source northward, which means the whales would be moving further into areas with shipping lanes and lobster traps.

Today, we will be talking about several promising solutions that we can act on quickly, including ropeless technology for lobster traps, vessel speed reductions, zooplankton monitoring, coordination with Canada, and more. In addition to this technological innovation and coordination, it is critical to move legislation like the bipartisan SAVE Right Whales Act, which was just reintroduced by my colleague Seth Moulton from Massachusetts. This bill would provide financial resources for research to develop and test technologies to reduce entanglements and vessel collisions to help the right whale.

However, in addition to entanglements and ship strikes, a new issue further endangers the North Atlantic right whale. In yet another handout to the oil and gas industry, the Trump administration is now actively threatening the long-term survival of these whales by opening up the Atlantic Coast to seismic air gun blasting and oil and gas exploration activities.

As we have consistently seen with other decisions from the Administration, this completely undermines our foundational environmental laws, like the Marine Mammal Protection Act and the ESA.

Seismic air guns are harmful to many forms of marine life, ranging from plankton, the base of the ocean food web, to fish and right whales. For right whales and other marine mammals, sound is critical for communication, feeding, navigation, and survival.

But just last year, NOAA Fisheries issued Incident Harassment Authorizations under the Marine Mammal Protection Act to allow five companies to use seismic air gun blasting to survey the Atlantic continental shelf for oil and gas. These air gun blasts occur as often as every 10 seconds for months at a time, creating noise that is louder than all but military-grade explosives. Thanks to NOAA issuing these authorizations, seismic companies plan to fire air guns a combined 5 million times over the course of their testing.

I also want to point out several major problems with these authorizations, considering the near-extinct status of this species.

First, even though five different companies requested permits to conduct surveys within similar time frames in similar locations, NOAA Fisheries did not consider the cumulative impacts here, the fact that when combined with each other and other activities, there is a vast increase in ocean noise. Instead, the agency analyzed the impacts of each survey in isolation, ignoring the fact that the ocean is already a very loud place and set to become 5 million blasts louder under these authorizations.

Second, NOAA Fisheries' proposed mitigation is to prohibit blasting within 90 kilometers of the coast between November and April. But we know that right whales, including mothers and calves—the most vulnerable of the species—are present in this area nearly year-round, not just between November and April. We also know

that sound travels great distances underwater, and a small buffer like this is unlikely to shield these whales completely from the negative impacts of that seismic testing.

Third, under the Obama administration, BOEM rejected the seismic permit applications for testing in the Atlantic because of the impacts on marine life, including the right whale. They stated, "The value of obtaining the geophysical information from the new seismic air gun surveys in the Atlantic does not outweigh the potential risks of those surveys' acoustic pulse impacts on marine life." I have not seen any new science that suggests that these risks have changed.

Finally, this activity could start imminently. The company can begin air blasts within 30 days of BOEM's issuing of the permits. But seismic blasts could make the difference between recovery and extinction for right whales.

Given the many threats facing this species and the efforts underway to save them, it makes no sense for NOAA Fisheries to allow seismic blasting to occur.

There are some truly useful technologies and innovations that we can look at to help the right whale. I look forward to hearing more about that today. But it is also critical that we don't add new threats just to make the oil industry a few more bucks.

With that, I look forward to hearing from our witnesses.

[The prepared statement of Mr. Huffman follows:]

PREPARED STATEMENT OF THE HON. JARED HUFFMAN, CHAIR, SUBCOMMITTEE ON WATER, OCEANS, AND WILDLIFE

Good morning. Thank you for joining us today for an important hearing examining the many threats facing one of the most endangered marine mammals: the North Atlantic right whale.

There are less than 420 right whales remaining—that's fewer right whales in existence than Members of Congress. If more is not done to save this iconic species, scientists predict that the they could go extinct in the next few decades.

According to NOAA Fisheries, in order to maintain a sustainable right whale population, no more than one right whale per year can be killed by human causes. And as Dr. Kraus has pointed out in his written testimony, that number has been exceeded every single year for the last 20 years. No wonder these whales are in such a dire situation.

In 2017, they had a particularly bad year: there were 17 deaths and no new calves. While we have seen positive news recently, including seven right whale calves spotted this year, there are still ongoing threats, including fishing gear entanglement and accidental ship strikes. Additionally, science shows that climate change may be shifting their food source northward. This means right whales will be moving further into areas with shipping lanes and lobster traps.

Today, we will talk about several promising solutions we can act on now, including ropeless technology for lobster traps, vessel speed reductions, zooplankton monitoring, coordination with Canada, and more. In addition to technology innovation and coordinated management, it's critical to move legislation, like the bipartisan SAVE Right Whales Act, introduced by my colleague Congressman Moulton from Massachusetts last Congress. This bill would provide financial resources for research to develop and test technologies to reduce entanglements and vessel collisions to help the survival of the right whale.

However, in addition to entanglements and ship strikes, a new issue further endangers the North Atlantic right whale. In yet another handout to the oil and gas industry, the Trump administration is now actively threatening the long-term survival of the North Atlantic right whale by opening the Atlantic Coast to seismic air gun blasting and oil and gas exploration activities.

As we've consistently seen with other decisions from the Trump administration, this completely undermines our foundational environmental laws, like the Marine Mammal Protection Act and the Endangered Species Act.

Seismic air guns are harmful to many forms of marine life ranging from plankton, the base of the ocean food web, to fish and whales. For right whales and other marine mammals, sound is critical for communication, feeding, and navigation.

But just last year, NOAA Fisheries issued Incidental Harassment Authorizations under the Marine Mammal Protection Act to allow five companies to use seismic air gun blasting to survey the Atlantic Continental Shelf for oil and gas. These air gun blasts occur as often as every 10 seconds for months at a time, creating a noise that is louder than all but military-grade explosives. Thanks to NOAA issuing these authorizations, seismic companies plan to fire air guns a combined 5 million times over the course of their testing. I have my air horn here with me today, if anyone wants to know what it's like to be subjected to that kind of noise.

I also want to point out several major problems with these authorizations, considering the near-extinct status of the North Atlantic right whale:

First, even though five different companies requested permits to conduct surveys within similar time frames and in similar locations, NOAA Fisheries did not consider the effects of the five seismic surveys when combined with each other or with other activities that cause ocean noise. Instead, the agency analyzed the impacts of each survey in isolation, ignoring the fact that the ocean is already a very loud place and set to become 5 million blasts louder under these authorizations.

Second, NOAA Fisheries' proposed mitigation is to prohibit seismic blasting within 90 kilometers of the coast between November and April. But we know that right whales, including mothers and calves—the most vulnerable of the species—are present in this area nearly year-round—not just between November and April. We also know that sound travels great distances underwater, and a small buffer is unlikely to shield these whales completely from the negative impacts of seismic testing.

Third, under the Obama administration, BOEM rejected the seismic permit applications for seismic testing in the Atlantic because of the impacts on marine life, including the right whale. They stated that the "value of obtaining the geophysical information from the new seismic airgun surveys in the Atlantic does not outweigh the potential risks of those surveys' acoustic pulse impacts on marine life." I haven't seen any new scientific information showing that the potential risks have changed.

Finally, this activity could start imminently—the companies can begin air gun blasts within 30 days of the Bureau of Ocean Energy Management (BOEM) issuing the permits for exploration. But seismic blasts could make the difference between recovery and extinction for right whales.

Given the many threats facing this species and the efforts underway to save each and every whale, it makes no sense that NOAA Fisheries would allow seismic blasting to occur.

There are some truly useful technologies and policies that we should expand and implement to protect right whales, and I look forward to hearing more about what can be done. But it's also critical that we don't add any new threats just to make the oil industry a few bucks.

With that, I look forward to hearing from NOAA and our panel of scientific experts today. I now invite the Ranking Member for his remarks.

Mr. HUFFMAN. I now invite the Ranking Member to give his remarks.

STATEMENT OF THE HON. TOM MCCLINTOCK, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. MCCLINTOCK. Thank you, Mr. Chairman. The problem with visions of impending apocalypse is that after the initial hysteria passes, life goes on and the world does not end. I cannot imagine how disappointing that is to the prophets of doom. Chicken Little found that out to her embarrassment and I think many today could learn from her example.

For example, at our hearing on rising oceans recently, the only climatologist on the panel confirmed that sea level rise has been steady throughout the 20th century and shows no correlation with atmospheric carbon dioxide levels. Indeed, he noted the oceans have been rising about 400 feet since the last Ice Age, and could

be expected to continue to do so very gradually until temperature equilibrium is achieved.

In the 1980s, climate change was blamed for the impending extinction of the polar bear. You may have noticed we don't hear much about polar bear extinction these days because it turns out their populations are doing very well, thank you, and have actually been increasing nicely since 2005, along with carbon dioxide levels.

Today, we adopt a new mascot, the right whale. The right whale got its name from the whalers who drove it nearly to extinction in the days when whale oil was in high demand. It was the "right" whale to hunt to supply the lucrative whale oil market. Ironically, it may have been saved from outright extinction by—wait for it—fossil fuels, which made whale oil obsolete.

Now, however, the right whale is being repurposed as an excuse to discourage fossil fuel use and to impede offshore exploration. We hear voices accusing the dreaded Donald Trump of decimating marine animals by his administration's support of Incidental Harassment Authorizations which allow for limited seismic testing in the Atlantic outer continental shelf.

Before we all set our hair on fire, let's confront a few inconvenient truths. It was the Obama administration's 2015 5-year oil and gas leasing program that initially proposed opening the Atlantic to offshore energy exploration, and it was the Obama administration that approved multiple permits supporting seismic testing. From 2015 through 2017, Columbia University received four permits for seismic activity to gather scientific data, including two permits for seismic testing in the Atlantic. Furthermore, the U.S. Geological Survey conducted seismic surveys in the Atlantic Ocean between 2014 and 2015.

Seismic testing is not unique to offshore oil and gas exploration, nor has it been found to be detrimental to marine mammal stocks. Under the Obama administration, the National Marine Fisheries Service and the Bureau of Ocean Energy Management both determined that there is no documented evidence of anything more than a negligible impact to marine mammals resulting from exposure to seismic testing on the ocean floor. It may be annoying, but it is far from dangerous.

We may hear much about the "taking" of marine mammals under the Marine Mammal Protection Act. To most people, "taking" sounds like a euphemism for killing. In fact, I think it is meant to convey this false impression. But as actually used in the Act, it means anything that disturbs marine animals, irrespective of the health of the marine mammal stock.

Whaling excesses in the pre-fossil fuels period almost destroyed the right whales in the North Atlantic and the Northern Pacific. Their populations were driven so low that they are barely measurable today, particularly in the Northern Pacific. And sadly, they have shown little sign of recovery. Fortunately, they are doing very well in the Southern Atlantic and Pacific. According to the Marine Mammal Center, "the breeding populations of Argentina, Brazil, South Africa, and Australia have shown evidence of strong recovery, with annual increase rates of 7–8 percent, and together may now total over 16,000."

And there is more good news. In the North Pacific and Atlantic, other species of whales hunted in the last century are recovering, including blue whales, growing about 3 percent per year, humpback whales, which have already recovered their pre-whaling populations, fin whales, growing 4 to 5 percent per year in the North Pacific, with their populations in the North Atlantic described as "healthy"—all of this according to the Marine Mammal Center.

So, there is a lot here to celebrate. Most whale species are recovering in the Northern Hemisphere, and the right whale population is making a strong recovery in the Southern Hemisphere, all under current conditions. Happily, so too is American energy independence and the American economy, with great promise for future prosperity and growth from our offshore reserves.

So, Mr. Chairman, let's try not to screw all that up today, please.

[The prepared statement of Mr. McClintock follows:]

PREPARED STATEMENT OF THE HON. TOM MCCLINTOCK, RANKING MEMBER, SUBCOMMITTEE ON WATER, OCEANS, AND WILDLIFE

The problem with visions of impending apocalypse is that after the initial hysteria passes, life goes on and the world doesn't end. How disappointing that must be to the prophets of doom! Chicken Little found this out to her embarrassment and many today could learn from her example.

At our hearing on rising oceans, the only climatologist on the panel confirmed that sea level rise has been steady throughout the 20th century and shows no correlation to atmospheric carbon dioxide levels. Indeed, the oceans have risen about 400 feet from the last ice age and can be expected to continue to do so very gradually until temperature equilibrium is achieved.

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Before we light our hair on fire, let's confront a few inconvenient truths.

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Seismic testing is NOT synonymous with offshore oil and gas extraction, nor has it been found to be detrimental to marine mammal stocks. Under the Obama administration, the National Marine Fisheries Service and the Bureau of Ocean Energy Management both determined that there is no documented evidence of any more than a "negligible impact" to marine mammals resulting from exposure to seismic testing of the ocean floor. It may be annoying, but it is far from dangerous.

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to the International Whaling Commission, "the breeding populations of Argentina/Brazil, South Africa and Australia have shown evidence of strong recovery with annual increase rates of 7–8 percent and together may now total over 16,000 . . ." More good news: in the North Pacific and Atlantic, other species of whales hunted in the last century are recovering, including blue whales, (growing about 3 percent per year), humpback whales (which have recovered their pre-whaling populations), fin whales (growing 4 to 5 percent per year in the North Pacific with their populations in the North Atlantic described as "healthy." All this according to the International Whaling Commission.

So there's a lot to celebrate. Most whale species are recovering in the Northern Hemisphere and the right whale population is making a strong recovery in the Southern Hemisphere—all under current conditions. Happily, so too is American energy independence and the American economy, with great promise of future prosperity and growth from our offshore reserves.

Let's not screw that up today, please.

Mr. HUFFMAN. Thank you, Mr. McClintock. I feel so much better hearing that this is all a hoax and hysteria. Perhaps the experts and scientists we will hear from will confirm that, and then we can all just go home. Let's find out.

Right now, before we move to the witnesses, I ask unanimous consent that the gentleperson from Virginia, Mr. Beyer, and also the gentleman from Massachusetts, Mr. Moulton, be allowed to sit on the dais and participate in today's proceeding.

Without objection, it is so ordered.

Now, I will introduce our first witness. Welcome to Chris Oliver, the Assistant Administrator for NOAA Fisheries. Welcome, Mr. Oliver. Mr. Oliver, under the Committee Rules, you must limit your oral statements to 5 minutes. But your entire statement will appear in the record.

When you begin, the lights on the witness table will turn green. After 4 minutes, the yellow light will come on, and your time will have expired when you see the red light. I will ask you at that point to wrap up.

The Chair now recognizes you to testify.

STATEMENT OF CHRIS OLIVER, ASSISTANT ASMRR, NOAA FISHERIES, SILVER SPRING, MARYLAND

Mr. OLIVER. Good morning, Mr. Chairman, and thank you for the opportunity to testify. Chris Oliver with NOAA Fisheries.

North Atlantic right whale is one of the world's most endangered large whale species, with an estimated, as you mentioned, 411 individuals. In the early 1990s, the successful implementation of measures aimed at reducing primary threats resulted in some encouraging population growth.

However, since 2010, the whales have experienced another period of decline; because the population is very small, its status can change quickly. Right whales have also made recent large-scale changes in habitat use, spending more time farther offshore and to the north, likely in pursuit of better foraging opportunities.

They are protected under both the Endangered Species Act and the Marine Mammal Protection Act, and have been listed as endangered since 1970. We are currently implementing a North Atlantic right whale recovery plan, with the ultimate goal of recovering this species.

We are working to protect and recover this species on multiple fronts. Human interaction, such an entanglement in fishing gear and vessel strikes, currently present the greatest threat. Collisions between whales and vessels often go unnoticed and unreported. Research demonstrates that the probability of large whale mortality and serious injury from vessel strikes increases with vessel speed.

NOAA Fisheries has taken several steps to reduce this threat, including requiring vessels to slow down in areas where whales may be present, encouraging voluntary speed reductions, recommended alternative shipping routes and international shipping lanes, developing right whale alert systems and vessel reporting systems, and improving our stranding response.

Since 2008, we have limited vessel speeds to 10 knots for vessels greater than 65 feet in seasonal management areas along the U.S. East Coast. The purpose of this regulation is to reduce the likelihood of deaths and serious injuries to endangered whales resulting from collisions with ships. In the 10 years prior to implementation of that regulation, there were 11 confirmed right whale mortalities due to vessel strikes in U.S. waters. In the 10 years since, only three ship strike mortalities have been confirmed. Entanglements in fishing gear is the other primary cause of serious injury and death for many whales, including right whales. We require fishermen to use certain gear modifications to reduce entanglement risk such as sinking ground lines, weak link connections, pot limits, and closed areas.

However, entanglements continue to be a source of injury and mortality, with at least seven mortalities occurring during the 2017 unusual mortality event. In addition, we are working with the Atlantic States Marine Fisheries Commission to develop management measures to further reduce the risk of entanglements in gear.

On the international front, we recognize the transboundary range of this species requires international collaboration. We are actively working with Canada on the gaps in both science and management impeding the recovery of North Atlantic right whales. In March of last year, Canada adopted regulations on its commercial fishing and maritime shipping industries to minimize both gear entanglements and ship strikes in advance of the North Atlantic right whale migrations, which is now into the Gulf of Saint Lawrence.

Continuing bilateral engagement and implementation of our respective regulatory regimes will ensure that the United States and Canada are fully complying with the Marine Mammal Protection Act and eliminating the risks to North Atlantic right whales while ensuring sustainable fisheries and trade.

As we move forward, NOAA Fisheries and our partners will strive to make progress in rebuilding the North Atlantic right whale population. This year we anticipate the Atlantic States Marine Fisheries Commission to consider developing an addendum to its lobster management plan to consider measures to reduce the number of buoy lines used by American lobster fishermen by up to 40 percent. This would represent a substantial reduction in gear and significantly reduce the probability of entanglements.

Further, the Atlantic Large Whale Take Reduction Team will meet the week of April 22 to develop additional recommended

changes to the take reduction plan. These include additional closure areas as well as reporting, monitoring, and expanded gear marking requirements.

Finally, as you noted, Mr. Chairman, NOAA Fisheries is pleased to report the births of several right whale calves this season, seven as of February 20, which is good news, given that it comes on the heels of virtually no calf production.

Thank you for the opportunity to discuss our conservation measures today, and I would be happy to try to answer any questions that you may have.

[The prepared statement of Mr. Oliver follows:]

PREPARED STATEMENT OF CHRIS OLIVER, ASSISTANT ADMINISTRATOR FOR FISHERIES, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE

Chair and members of the Subcommittee, I am Chris Oliver, Assistant Administrator for the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) within the Department of Commerce. Thank you for inviting me to testify today on North Atlantic right whales. NMFS is responsible for the stewardship of the Nation's ocean resources and their habitat. We provide vital services for the Nation: productive and sustainable fisheries, safe sources of seafood, the recovery and conservation of protected resources, and healthy ecosystems—all backed by sound science and an ecosystem-based approach to management.

ABOUT THE SPECIES AND OUR ROLE

The North Atlantic right whale is one of the world's most endangered large whale species, with an estimated 411 individuals remaining. By the early 1890s, commercial whalers had hunted right whales in the Atlantic to the brink of extinction. After commercial whaling stopped, right whales had several decades of slow recovery and by 1992, there was an estimated minimum population of 295 individuals. In the early 1990s, the successful implementation of measures aimed at reducing the primary threats, identified through extensive collaboration among stakeholders, resulted in further growth of the population to approximately 481 individuals in 2010. However, since 2010, North Atlantic right whales have experienced another period of decline. Because the population is very small, its status can change quickly. In addition, North Atlantic right whales have made recent, large-scale changes in their habitat use, spending more time farther offshore and to the north, likely in pursuit of better zooplankton foraging opportunities.

North Atlantic right whales are protected under both the Endangered Species Act and the Marine Mammal Protection Act. They have been listed as endangered under the ESA since 1970 and as such, NMFS developed and is implementing a North Atlantic Right Whale Recovery Plan. The ultimate goal of the Recovery Plan is to recover the North Atlantic right whale, with an interim goal of down-listing its status from endangered to threatened. The major actions recommended in the Recovery Plan include reducing or eliminating injury and mortality caused by vessel collisions or by fishing gear, protecting habitats essential to the survival and recovery of the species, and minimizing the effects of vessel disturbance.

NMFS and our partners are committed to conserving and rebuilding the North Atlantic right whale population using a variety of innovative techniques to study, protect, and rescue these endangered whales. We also engage our partners as we develop regulations and management plans that foster healthy fisheries and reduce the risk of entanglements, create whale-safe shipping practices, and reduce impacts from ocean noise.

EFFORTS UNDERWAY

NMFS is working to protect this species on multiple fronts, with the goal that its population will increase. The leading causes of known mortality for North Atlantic right whales are vessel strikes and entanglement in fishing gear.

VESSEL STRIKES

Collisions between whales and vessels often go unnoticed and unreported. However, research demonstrates that the probability of large whale mortality and serious injury from vessel strikes increases with increasing vessel speed. Thus, NMFS has taken several steps to reduce the threat of vessel collisions with North Atlantic right whales, including requiring vessels to slow down in certain areas and during seasons when whales may be present, encouraging voluntary speed reductions in Dynamic Management Areas, recommending alternative shipping routes and areas to be avoided, modifying international shipping lanes, developing right whale alert systems and mandatory vessel reporting systems, increasing outreach and education, and improving our stranding response.

Since 2008, NMFS has limited vessel speeds to 10 knots for vessels 65 feet or greater in overall length in Seasonal Management Areas along the U.S. East Coast at certain times of the year. In the 10 years prior to implementation of the vessel speed regulation, there were 11 confirmed U.S. right whale mortalities due to vessel strikes, but in the 10 years since the regulation has been active, only 3 were documented in U.S. waters.

NMFS is currently conducting a review of its vessel speed restriction rule (pursuant to 50 CFR 224.105). The review will culminate in a report that will assess: economic impacts to the maritime community, vessel traffic compliance with the rule, impacts to navigational safety, conservation benefits to right whales, and outreach activities conducted to date. Staff and contractors are analyzing the latest relevant data in collaboration with other agencies and scientists. The review is well underway, and we hope to have a final report issued by the end of FY 19.

ENTANGLEMENTS

Over more than two decades, NMFS has implemented management measures to reduce whale entanglements with the help of the Atlantic Large Whale Take Reduction Team—a group of stakeholders consisting of fishermen, scientists, and state and Federal officials. Entanglement in fishing gear is a primary cause of serious injury and death for many whale species, including the North Atlantic right whale. We require commercial fishermen to use certain gear modifications that are meant to reduce entanglement risk to North Atlantic right whales and have established areas where fishing cannot take place during certain times when North Atlantic right whales are present.

However, entanglement in fishing gear continues to be a source of serious injury and mortality for this species; therefore, we are currently working with the Atlantic States Marine Fisheries Commission and the Take Reduction Team to develop management measures to further reduce the risk of entanglement in fishing gear. Specifically, the Atlantic Large Whale Take Reduction Team will be meeting during the week of April 22 to develop recommended changes to the Take Reduction Plan that would reduce the effects of fixed gear fisheries on North Atlantic right whales. NMFS expects the Take Reduction Team to consider recommendations for line reduction measures and additions or modifications to seasonal closure areas to reduce impacts of these fisheries on large whales as well as revised or expanded reporting, monitoring, and gear marking requirements which would allow NMFS to better evaluate the impacts of these fisheries to North Atlantic right whales.

INTERNATIONAL COLLABORATION

NOAA is actively collaborating with Canada on the science and management gaps that are impeding the recovery of North Atlantic right whales in both Canadian and U.S. waters through ongoing bilateral negotiations. In March 2018, Canada adopted regulations applicable to its commercial fishing and maritime shipping industries to minimize gear entanglements and ship strikes in advance of North Atlantic right whales migrating into Canadian waters. In early February, these measures were further refined as Canada identified how it intends to protect North Atlantic right whales during the 2019 Canadian snow crab season in the Gulf of St. Lawrence.

In 2016, NMFS issued final regulations to implement the import provisions of the Marine Mammal Protection Act. Pursuant to these provisions, NMFS will evaluate Canadian fisheries from which fish and fish products are exported to the United States to assess the effectiveness of Canada's regulatory program in mitigating bycatch of marine mammals. Consultations on the applicable Canadian commercial fisheries will continue through March 2021 per the existing regulatory timeline for making comparability determinations. To date, NOAA has consulted with Canada's Department of Fisheries and Oceans to identify priority fisheries and elements of a comparable regulatory program to meet the required framework of the MMPA

import provisions. Continuing our bilateral engagement and implementation of our respective regulatory regimes will ensure that the United States and Canada are fully complying with the MMPA and eliminating the risk of North Atlantic right whale entanglements in fisheries while ensuring sustainable fisheries and trade continue.

ATLANTIC IHAs

Late last year, NMFS issued final authorizations under the Marine Mammal Protection Act to incidentally, but not intentionally, harass marine mammals to companies proposing to conduct geophysical surveys in support of hydrocarbon exploration in the Atlantic Ocean. The authorizations require the companies to implement mitigation measures to reduce the impacts of survey activities on marine mammals and set forth monitoring and reporting requirements. Our actions only address the taking or harassment of marine mammals incidental to the planned surveys. The Department of the Interior has jurisdiction over decisions to allow the surveys and any future drilling, pursuant to its authority under the Outer Continental Shelf Lands Act. NMFS can only issue an authorization for the incidental take (harassment) of small numbers of marine mammals if it finds that the taking associated with a specified activity will have a negligible impact on the affected species or stock(s); and prescribes appropriate mitigation, as well as requirements for monitoring and reporting of such takings. After extensive analysis, NMFS developed rigorous mitigation, monitoring, and reporting requirements for the proposed Atlantic geophysical surveys. For North Atlantic right whales, we specified measures that limit activities in areas where they are expected to be present, including all designated critical habitat and additional seasonal management areas throughout the survey area. Specifically, the mitigation area restricts seismic operation within 90 km of the coast from November through April. Seismic operations are also required to be suspended if North Atlantic right whales are detected at an extended shutdown distance within 1.5 km of the vessel.

NEXT STEPS

As stated above, NMFS and our partners are committed to continuing the progress made in rebuilding the North Atlantic right whale population. At its February meeting, the Atlantic States Marine Fisheries Commission voted to develop an addendum to the Lobster Management Plan to consider measures to reduce the number of buoy lines used by American lobster fishermen by up to 40 percent. Since more than 90 percent of the buoy lines in the areas frequented by right whales are associated with the lobster fishery, this would represent substantial line reduction. A vote on whether to send the Addendum out for public comment could occur as early as the Commission's April 30 spring meeting, allowing final decision making in August 2019.

In addition, NMFS will continue to conduct science related to assessing the current status of whales, including monitoring calf production, and decreasing the risk of entanglements and vessel strikes. This work occurs from the Southeast to the Northeast and extends into Canadian waters, working in collaboration with colleagues at the Department of Fisheries and Oceans. On the topic of calves, despite unusually low recruitment to the population between 2012 and 2018, there has been some encouraging news lately with several births documented this calving season (7 calves as of February 20, 2019).

Thank you again for the opportunity to discuss North Atlantic right whales. I would be happy to answer any questions you may have.

QUESTIONS SUBMITTED FOR THE RECORD TO CHRIS OLIVER, ASSISTANT ADMINISTRATOR FOR FISHERIES, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE

Questions Submitted by Rep. Cunningham

Question 1. Mr. Oliver, 10 Atlantic states along with several NGOs have filed lawsuits against the issuance of these Incidental Harassment Authorizations. With all of this opposition, why would the Trump administration move forward with offshore oil exploration?

Answer. Executive Order 13795, *Implementing an America-First Offshore Energy Strategy*, established it as the policy of the United States to encourage energy exploration and production in order to maintain our Nation's position as a global energy

leader while ensuring that any such activity is safe and environmentally responsible. E.O. 13795 finds that energy and minerals produced from Federal lands and waters are important to a vibrant economy as well as national security, while also reducing our reliance on imported energy. As a result of these and other policies, in November 2018 the United States was a net exporter of energy for the first time in over three decades.

Jurisdiction over decisions to allow geophysical surveys and any future drilling rests with the Department of the Interior pursuant to their authority under the Outer Continental Shelf Lands Act. It is the role of the Department of Commerce's National Marine Fisheries Service (NMFS), administered through the National Oceanic and Atmospheric Administration (NOAA), to ensure that such activity is consistent with applicable statutory authorities for which NMFS is responsible. Considerable analysis, using the best available science, was utilized in making the decision to approve incidental harassment authorizations (IHAs) that fully comply with the Marine Mammal Protection Act (MMPA), Endangered Species Act (ESA), and National Environmental Policy Act (NEPA). NMFS made the necessary statutory findings and prescribed appropriate mitigation, monitoring, and reporting requirements. The approved IHAs are designed to ensure that the geophysical activity will have no more than a negligible impact on the affected species or stocks, as required by the MMPA. Moreover, NMFS believes that the prescribed and extensive mitigation requirements meet the MMPA legal standard of having the least practicable adverse impact on the affected species or stocks and their habitat.

Question 2. Mr. Oliver, as of 2016, South Carolina valued coastal tourism at $8.96 billion, and commercial fisheries at $42.4 million. A report from the American Petroleum Institute says that opening the Atlantic to oil and gas exploration would bring only $1.5 billion in state and local tax revenues over 20 years. Do you believe that the $1.5 billion revenue exceeds the risk of an oil spill devastating the nearly $9 billion tourism industry?

Answer. The Department of the Interior (DOI) has jurisdiction over decisions to allow the surveys and any future drilling, pursuant to its authority under the Outer Continental Shelf Lands Act. NMFS's role is to ensure that such activity is consistent with applicable statutory authorities for which NMFS is responsible (e.g., MMPA and ESA). Thus, DOI is best suited to address your question.

Question Submitted by Rep. Levin

Question 1. Mr. Oliver, can you provide the Subcommittee with any internal documents held by NMFS that express scientific concern over the cumulative impacts of the five issued Incidental Harassment Authorizations on North Atlantic right whales or other marine mammals? Can you provide any internal documents from NMFS that voice scientific concern for marine mammals in regards to the 160-decibel level authorized in the Atlantic for seismic testing, which is much higher than the 120-decibel level previously authorized in the Gulf of Mexico? Can you provide any documents that explain the difference in these policies? Please provide any scientific information used in making these determinations.

Answer. The Administrative Record for Incidental Harassment Authorizations will be made available to the Committee.

Question Submitted by Rep. Sablan

Question 1. Mr. Oliver, at the hearing you responded to my question regarding NOAA Fisheries supervision of WESPAC and the Fishery Councils by stating that you do not have direct supervision of the Councils. Section 302 of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) established the eight Regional Fishery Management Councils. The objectives of these councils are to develop, monitor and revise fishery management plans and data collection programs for domestic and foreign fishing conducted within the 200-mile U.S. Exclusive Economic Zone (EEZ). This is done with the approval and implementation of the Secretary of Commerce, who has stewardship responsibilities under MSFCMA for living marine resources in the EEZ. The NOAA Fishery website states that "We support the councils by conducting the annual nomination and appointment process, training new members, and facilitating periodic meetings of the Council Coordination Committee. We also work with the councils to designate essential fish habitat for federally managed species. Together we research and describe habitats essential for each life stage of many species, create maps, and designate Habitat Areas of Particular Concern." And doesn't NOAA also allocate and track Federal funding to

the Councils as well and receive performance progress and financial reports? And, among other things, do not Fishery Council members file financial disclosure reports with NOAA and NOAA attorneys advise Council members and make determinations regarding recusal for conflicts of interest? Could you please clarify exactly what role NOAA plays in regards to WESPAC and the other seven Regional Fishery Management Councils?

Answer. The role the Secretary of Commerce, NOAA, and NMFS in regard to the eight Regional Fishery Management Councils, is detailed in the Magnuson-Stevens Act (MSA) and its implementing regulations. Primarily, the Councils develop and amend fishery management plans for approval and implementation by NMFS on behalf of the Secretary of Commerce. NOAA allocates funding to the eight Councils, and Council activities are governed by grant mechanisms described in 50 CFR 600.125. NOAA partners with the Councils on research priorities and policy implementation to achieve conservation and management of our Nation's fisheries.

NMFS and the Councils published Operational Guidelines that provide guiding principles for the partnership between NMFS and the Councils. How each Council and NMFS Regional Office pair implements the MSA and other requirements throughout the fishery management process are set forth in Regional Operating Agreements. These agreements are found here: https://www.fisheries.noaa.gov/national/partners/operational-guidelines.

Congress appropriates funding for the eight Regional Fishery Management Councils (Councils). Funds are allocated to the Councils according to a historical formula, agreed to by all eight Councils, that has been in place for well over a decade. Per regulation, at 50 CFR 600.125(a), Council activities and expenditures are managed via grant and/or cooperative agreement mechanisms, with coordination via a Federal Program Officer. Such funding is provided consistent with the stated priorities and objectives of the grant. Funding is subject to 5-year grant parameters under the OMB Uniform Guidance and NOAA Administrative Standard Award Conditions. Both the OMB guidance and the NOAA standard conditions contain reporting requirements. The standard reporting frequency is semi-annually (every 6 months).

Per Section 302(j) of the MSA, "affected individuals" (i.e., Council nominees, Council members, and members of SSCs) must file Statements of Financial Interests. This financial information must be disclosed on the NOAA Form 88–195, Statement of Financial Interests. Guidance on reporting and filing procedures for complying with financial disclosure requirements is found at: https://www.fisheries.noaa.gov/national/partners/financial-disclosure-statements and at 50 CFR 600.235.

A Council member required to disclose a financial interest under 302(j)(2) of the MSA may not vote on a Council decision that would have a "significant and predictable effect" on a financial interest disclosed on his or her Statement of Financial Interests. At the request of the member, or at the initiative of an appropriate designated official, the designated official shall make a determination for the record as to whether a Council decision would have a "significant and predictable effect" on a financial interest that would require that the member be recused from a vote on a Council decision. The term "designated official" is defined in Section 302(j)(1)(B) of the MSA, but typically is an attorney of the NOAA Office of General Counsel.

Section 302(j)(9) of the MSA requires the Secretary to submit an annual report to Congress on actions taken by the Secretary and the Councils to implement the disclosure of financial interest and recusal requirements of the MSA. More information about the recusal process and these requirements can be found in that report at: https://www.fisheries.noaa.gov/national/partners/council-reports-congress.

Mr. HUFFMAN. Thank you very much, Mr. Oliver.

I will begin the questioning for 5 minutes. And again, thank you for being here. One of the things that I hope to do in this Subcommittee, with many of these informational hearings, is to reset the factual and scientific baseline for these issues that we debate.

Mr. McClintock provides us with colorful quotes from people like Dickens and Lewis Carroll. But there is no substitute for actual facts and science. So, I would like to get a few things on the record with you, if I could. I want to get through several questions

quickly, so if you can, I would like you to answer yes or no. And when I refer to "the Agency," obviously I am talking about NOAA Fisheries.

So, true or false: There are about 420 North Atlantic right whales living today. Now, Dr. Kraus may say that is a bit of an overcount, but is that the general range, to your understanding?

Mr. OLIVER. Yes.

Mr. HUFFMAN. The Agency is concerned about the survival of this population. True?

Mr. OLIVER. Yes, sir.

Mr. HUFFMAN. The Potential Biological Removal, or PBR, is a term that your agency defined to quantify the number of whales that can be seriously injured or killed without impacting the population. Right?

Mr. OLIVER. I believe that is the generally accepted definition. yes, sir.

Mr. HUFFMAN. Yes. And for the last two decades, that number has hovered somewhere between zero and one. Is that right?

Mr. OLIVER. I believe that is correct.

Mr. HUFFMAN. But the actual number of right whale deaths each year has been higher than that, mainly because of ship strikes and fishing gear entanglements. Correct?

Mr. OLIVER. Yes.

Mr. HUFFMAN. Is the Agency proactively trying to address issues pertaining to entanglements and ship strikes in order to save the species?

Mr. OLIVER. Yes, sir.

Mr. HUFFMAN. You have put a lot of work into a recovery plan, as you are required to do under the Endangered Species Act. Correct?

Mr. OLIVER. Correct.

Mr. HUFFMAN. I hope to work with you more on that. But in the meantime, this year there is a little bit of good news. We have seven calves sighted so far. Right?

Mr. OLIVER. Yes, sir.

Mr. HUFFMAN. As we will hear from our second panel of experts, there are fewer than a hundred breeding females in the population. You agree with that assessment?

Mr. OLIVER. That is correct, yes.

Mr. HUFFMAN. And we know that females travel to the southeast each year to give birth, the breeding females. Is there scientific evidence that elevated ambient noise can cause chronic stress in baleen whales, especially breeding females?

Mr. OLIVER. There is evidence that the cumulative effects of acoustics can affect foraging behavior, calving, breeding behavior—basically sublethal effects relative to whale energetics, yes.

Mr. HUFFMAN. You agree with the science that says seismic noise increases the probability that right whale mothers and calves could get separated?

Mr. OLIVER. I am not an expert on acoustics, sir. I don't know the degree to which acoustics will directly——

Mr. HUFFMAN. Do you have any reason to disagree with that science?

Mr. OLIVER. No, sir.

Mr. HUFFMAN. And would you agree with the claim in Dr. Kraus' testimony in the second panel that seismic noise can disrupt behavior of baleen whales at tens to hundreds of kilometers?

Mr. OLIVER. Yes, sir.

Mr. HUFFMAN. Can it disrupt the plankton that they depend on for their food?

Mr. OLIVER. I don't know the answer to that one, sir.

Mr. HUFFMAN. Would you also agree that right whales may be present in an area but not visually detected?

Mr. OLIVER. That is correct.

Mr. HUFFMAN. But the Agency's mitigation requirements and the Incidental Harassment Authorizations only require a shutdown of activity if the whales are visually detected within 1,500 meters of the vessel, even though the science suggests there could be disruption from noise at tens to hundreds of kilometers?

Mr. OLIVER. Yes, sir. But we have measures in place to hopefully minimize the likelihood that those whales would be in the area at the same time those vessels are conducting those activities.

Mr. HUFFMAN. Understood. Your authorizations also apply only to 90 kilometers of the coast, even though seismic noise can travel long distances underwater and still increase the stress level on these whales within that buffer zone. Correct?

Mr. OLIVER. Correct.

Mr. HUFFMAN. It is also true that the Agency's mitigation requirement in these authorizations prohibit blasting within this limited buffer only between November and April. Correct? Even though we know that whales can be present during different time frames?

Mr. OLIVER. A little more than a yes or no response, sir. The other times of the year, there are still closures in effect out to 30 nautical miles. But based on the information we have, and we expanded those original closures between what we originally proposed at 47 kilometers out to 90, or nearly doubled it, based on some of the information you cite that the whales have expanded the areas they occupy seaward and northward. So, again, the likelihood of them being present in that area we feel is quite low during that time.

Mr. HUFFMAN. Last question, because you took a little extra time than I expected there. It seems to me on the one hand you are working to recover these animals. On the other hand, you are allowing very limited buffers and limited mitigations in your authorizations.

Were there internal conversations where some of your scientists objected to these permits?

Mr. OLIVER. No, sir. Our internal conversations focused on the best available science that we had.

Mr. HUFFMAN. There were no dissenters among the scientists on your team?

Mr. OLIVER. Dissenters to what?

Mr. HUFFMAN. To your decision to allow these activities to take place within these very limited buffers.

Mr. OLIVER. Our role is not to decide on issuing the permits, sir. It is to decide on the appropriate mitigation measures——

Mr. HUFFMAN. My question is whether there were scientists who believed that the mitigation measures were inadequate to protect the species.

Mr. OLIVER. I do not believe that is correct.

Mr. HUFFMAN. All right. Thank you.

I now recognize the Ranking Member.

Mr. MCCLINTOCK. Thank you. Mr. Oliver, in a hearing yesterday, Federal officials stated that there was more seismic testing under the Obama administration than under the Trump administration. Is that accurate?

Mr. OLIVER. I apologize, sir. I do not know the answer to that question. I am unfamiliar with the degree of seismic activity across the two administrations.

Mr. MCCLINTOCK. I am told that was the testimony in a hearing yesterday. If it is true, I am shocked, just shocked, that my friends on the left are not shocked.

Can you tell us, what are we observing of other whale species in the North Atlantic? Are they declining or increasing?

Mr. OLIVER. I don't know the specific statistics. We have had a couple of unusual mortality events with other whale species over the past few years in the Atlantic. But those are, I guess, disassociated in time and space, and it is not clear that there is a relationship among them.

Mr. MCCLINTOCK. Populations of many species are increasing, are they not?

Mr. OLIVER. Either stable or increasing.

Mr. MCCLINTOCK. And increasing by a significant rate, 3 to 5 percent, I read.

Mr. OLIVER. I have no reason to disagree with that number. I don't know the exact rate.

Mr. MCCLINTOCK. Mr. Kraus, I am told, will testify that the National Marine Fisheries Service's Biological Opinion on seismic impacts is flawed. Specifically, he mentions the 2017 model used by your agency. It was not adequate. Do you agree with this statement?

Mr. OLIVER. I don't agree with that statement. I would note that we are in the process of reconsulting and developing a new biological opinion.

Mr. MCCLINTOCK. Since he is going to follow you, do you want to address your concerns with his interpretation of the science here?

Mr. OLIVER. I don't know that I am in a position to do that at this time here today, sir.

Mr. MCCLINTOCK. Can you tell me, has this administration, or the previous, found that there is anything more than a negligible impact on whales due to seismic activity?

Mr. OLIVER. No, sir. I don't believe our agency has ever not issued or approved a request from an applicant for an Incidental Harassment Authorization, in either administration. And I would note that the prevailing scientific information is that seismic activity does not result in mortality or even serious injury; rather, the prevailing science is it does not. I would acknowledge there are other sublethal energetic effects.

Mr. MCCLINTOCK. And the whale populations that are increasing in the North Atlantic, I presume, are also affected by the same seismic testing.

Mr. OLIVER. They would be, yes, sir.

Mr. MCCLINTOCK. How about the right whale population in the Southern Hemisphere, which is described as increasing at about 3 percent, I believe?

Mr. OLIVER. I believe that is correct, 3 to 5 percent in the Southern Hemisphere. Correct.

Mr. MCCLINTOCK. So, they are doing quite well there with seismic testing. Something in the North Atlantic might have to do with the fact that the population left in the North Atlantic was so small to begin with.

As I understand it, seismic testing is already heavily regulated, including requirements that trained professionals be present to detect whales, with the power to shut down testing. Could you elaborate on the safeguards to seismic testing a bit?

Mr. OLIVER. Yes. As you have noted and I have noted earlier, we have to find a negligible impact when we are asked to review these authorization requests, and include mitigation monitoring and reporting requirements that result in the least practical adverse impact.

And if we are able to do so and we think that we have done so with what we believe are significant mitigation measures, including the 90 kilometer closure as well as multiple critical habitat and calving area closures that remain year round, along with the provision for shutdown if whales are detected within a mile and a half. So, we believe collectively those satisfy the standards that we are authorized to evaluate under the Marine Mammal Protection Act.

Mr. MCCLINTOCK. Can you tell us what the U.S. fishing industry has done to prevent interactions with right whales, and for that matter, any whales?

Mr. OLIVER. There is a lot of promising research, actually, and a lot of incentive upon the fishing industry, and particularly in the wake of the unusual mortality event we had in 2017, a renewed and redoubled effort by both our agency and Canada and the fishing industry to find ways to minimize those interactions, including sinking lines, reductions in the number of lines, breakaways, and some promising technology on the use of ropeless fishing gear.

Mr. MCCLINTOCK. Thank you.

Mr. HUFFMAN. The Chair now recognizes Mr. Van Drew for 5 minutes.

Dr. VAN DREW. Good morning, Mr. Oliver. Seismic air gun blasting for oil and gas has ramifications for all manner of marine life. Scientific studies show that seismic air gun noise can disturb, injure, or kill marine life, from zooplankton at the base of the food web, up to the fish and marine mammals at the top.

In a recent study, a single seismic air gun caused massive mortality in zooplankton, a viable prey species in the ecosystem, over a 1.5-mile swath of ocean. Air gun noise can delay growth and cause body abnormalities in young scallops. Sounds from seismic air guns can cause physical damage to fish hearing structures, and lead to hearing loss itself, which leaves them unable to use sound for communicating, feeding, or escaping predators.

Catch rates of some commercially and recreationally important fish species are known to decrease substantially in the wake of seismic air gun blasting for oil and gas. In fact, seismic air gun blasting can lead to declines in catch rates by as much as 80 percent of some fish species.

This is concerning, as healthy fish stocks are critical for our Nation to continue to thrive. And I believe we all know how important the fishing industry—just alone in my state of New Jersey, it is the third largest industry. This is concerning, as healthy fish stocks are critical for our Nation's fisheries to continue. How would this play out for Atlantic fisheries?

Mr. OLIVER. Congressman Van Drew, I am not certain I understand your question, whether it was relative to right whales or fisheries. We evaluate, as does BOEM in their issuance of permitting activities, through biological opinions, impacts on fisheries as well as essential fish habitat. So, that would be evaluated through essentially a separate process.

Dr. VAN DREW. How do you propose protecting fishermen and coastal businesses if catch rates drop in the Atlantic?

Mr. OLIVER. I am not aware of any specific evidence that indicates the proposed seismic activity that we are talking about would somehow directly affect catch rates. I apologize. If that information is there, I am not aware of it.

Dr. VAN DREW. OK. Regarding seismic surveys for oil and gas deposits off the Atlantic Coast, I have heard people say, "Why do we not just see what is out there?" They argue that it is OK to go ahead with seismic air gun surveys so that public and policy makers can weigh the pros and the cons of drilling for oil and gas in the Atlantic Ocean off of our coast.

Five companies have received permits from NOAA to conduct seismic air gun surveys in the Atlantic, and are seeking final authorizations from the Bureau of Ocean Energy Management and the Department of the Interior. If these five companies go ahead with seismic air gun blasting in the Atlantic, will we be able to see what is out there?

Mr. OLIVER. I presume that if they undertake their seismic activities, the point of doing so would be to ascertain whether and to what extent there are resources there that would warrant actual oil and gas exploration, which would also be permitted by BOEM.

Dr. VAN DREW. Will the public have access to the data collected by these companies on possible oil and gas deposits off of our shores?

Mr. OLIVER. I believe that much of the information they collect is proprietary. I think, through the EIS process, the public will have access to whatever information we have. But I cannot speak to every bit of information that may be proprietary to the particular companies involved.

Dr. VAN DREW. If that information will be available to the public, then why are there five different companies seeking permits to explore the same area?

Mr. OLIVER. I am not sure I have a good answer to that, Congressman. I guess they each needed a permit, so they each applied for a permit. I suppose it could have been done under a more

programmatic-type single authorization request. But in this case, there were five separate requests.

Dr. VAN DREW. Thank you, Chairman.

Mr. HUFFMAN. Thank you.

The Chair now recognizes Ms. González-Colón for 5 minutes.

Ms. GONZÁLEZ-COLÓN. Thank you, Mr. Chairman. And thank you to the witness for being here today with us.

In the past, the National Marine Fisheries Service has concluded that seismic surveying poses no significant threat to marine life. In 2014, for example, your agency concluded, and I want to quote here, "To date there is no evidence that serious injury, death, or stranding by marine mammals can occur from exposure to air gun pulses, even in the case of large air gun arrays." Is that still the case?

Mr. OLIVER. Yes. I believe that is still the case. We recognize there are other sublethal energetic effects, but not any direct mortality or serious injury effects.

Ms. GONZÁLEZ-COLÓN. Has the National Marine Fisheries Service found any new evidence since 2014 to conclude that seismic surveying significantly threatens the North Atlantic right whale and other marine species?

Mr. OLIVER. No.

Ms. GONZÁLEZ-COLÓN. Do vessel collisions, entanglement in lines and nets, and ingestion of plastic pose higher threats?

Mr. OLIVER. Yes, Congresswoman. In fact, vessel strikes and even more so entanglement in fishery gear are the two by far primary sources of mortality and serious injury.

Ms. GONZÁLEZ-COLÓN. Mr. Oliver, in 2018, NOAA Fisheries issued final authorization under the Marine Mammal Protection Act to incidentally but not intentionally harass marine mammals to companies proposing to conduct geophysical surveys in support of the hydrocarbon exploration in the Atlantic Ocean.

Can you discuss the procedures and the analyses that go into your agency's decision-making process when issuing those kind of authorizations?

Mr. OLIVER. I will try to be brief. It was a lengthy process that took place over a couple of years. It started before I came on board in this position, but it involved publication of proposed permits with attendant mitigation measures. It went through, I believe, two different public comment periods, where we received over 120,000 different public comments, including many very detailed technical and scientific-based comments from both proponents and opponents of that seismic activity.

Ultimately, following our proposed rule, we assessed those comments and made some changes to the proposed rule. In a couple of changes, we relaxed some protection measures, particularly with regard to small dolphins. In other cases, we actually expanded the protection measures from what was originally proposed—for example, for the right whale specifically, enlarging the closure area from 47 to 90 kilometers.

Ms. GONZÁLEZ-COLÓN. I do understand that the harassment definition between level A and level B are a little bit different. Right? And the one in level B is going to be a little complicated. It is going to be unclear on how it will be affected.

Can you give us an overview of the National Marine Fisheries Service effort to conserve and rebuild the North Atlantic right whale population, and how you understand Congress can help in that effort as well?

Mr. OLIVER. Yes, Congresswoman. From a general perspective, again, we are looking at taking regulatory and non-regulatory steps to reduce the threat of vessel collisions. And earlier in my testimony, I went through some of the details of that—so in the interest of time, I will not repeat them—where we are also in the process of reviewing those restrictions to assess both their effectiveness, the enforcement of compliance with them, as well as safety in navigation and coastal economic impacts, in order to assess perhaps changes to those restrictions.

And second, a lot of work going on in the area of entanglements, and a very heightened focus, including recent action by Canada in the Gulf of Saint Lawrence, and increased attention on the part of our fishermen and our fisheries management process to look at additional restrictions in U.S. fishermen waters, including development of ropeless fishing gear, including requirements for limitations on the number of traps that can be run, and—I will stop there. Sorry.

Ms. GONZÁLEZ-COLÓN. Thank you. Thank you for your comments. I yield back the balance of the time.

Mr. HUFFMAN. Thank you. The Chair now recognizes the Chairman of the Natural Resources Committee, Mr. Grijalva, for 5 minutes.

Mr. GRIJALVA. Thank you very much, Mr. Chairman and Ranking Member, for the courtesy. Mr. Chairman, I want to thank you. The hearings that this Committee has undertaken have been substantive, empirical information being at the center of the discussion.

And that sets a very good, I think, tone for how we should be dealing with a lot of the questions that face the Committee as a whole, and that is the fact that science needs to guide us, fact needs to guide us, because we are dealing with elements in our jurisdiction that demand that. And the fact that we have ignored it does not make it right. So, I want to thank you for that, and for the tone.

And thank you, Mr. Oliver, for your testimony and for being here. Let me just go into some questions on some issues that perhaps I think also need to be covered relative to your testimony.

Mr. Oliver, some reports indicate that up to 85 percent of North Atlantic right whales have scars associated with interactions with fishing gear. And my question is: What is NOAA doing, or planning to do, to ensure that such fishing lines are not deployed in times and places where right whales are present at the time? Does NOAA have a strong understanding of where fishing that impacts right whales is occurring? And what is the process to address that particular question? If I may, Mr. Oliver.

Mr. OLIVER. Thank you, Mr. Congressman. A number of areas in response to that question.

The most important thing that we can do to minimize these entanglement occurrences is to better understand where and when right whales are occurring. And we know that through recent

scientific studies and information they are changing some of those patterns. For example, part of the reason we had the large mortality event in 2017 is they apparently moved into the Gulf of Saint Lawrence in Canadian waters where there was a concentration of fishing gear, which was a relatively new migration pattern.

Mr. GRIJALVA. If I may to that point, Mr. Oliver, so right whales are migrating to new locations, in part due to climate change. So, to that point that you made, what is NOAA doing to address climate change shifts? And as migrating patterns shift because of the change, what appropriate management tools, new technologies—what is being used to deal with that ongoing reality now that we know that?

Mr. OLIVER. Well, we are trying to better understand where these shifts in zooplankton and phytoplankton are occurring so that we can predict where right whales are more likely to occur so that we can in turn consider restrictions or fisheries closures in those areas.

And again, it is a matter of us understanding where those whales are going to be and taking the necessary measures to reduce the juxtaposition of those whales and fishing gear. And we have a lot of research ongoing in that regard.

Mr. GRIJALVA. Specifically, Mr. Oliver, the regulations to reduce the fatal ship strikes on right whales have successfully, in that area, lowered the mortality. I am aware thought NOAA is currently in the process of analyzing that particular rule, including its effectiveness and its cost.

First of all, is that a true statement?

Mr. OLIVER. Yes.

Mr. GRIJALVA. And where is the status of that review at this point?

Mr. OLIVER. We expect a preliminary report by this summer, which would then be subject to both peer review and public comment, and the issuance of a final report later this year.

Mr. GRIJALVA. And to absolutely put you on the spot, can you assure us that NOAA will not recommend undermining the protections currently in place under that rule for right whales through this review?

Mr. OLIVER. I cannot share what the outcome of the review is going to be. But I am certainly hopeful that, given the current status of the species, that any relaxation in certain areas would be for a very, very good reason based on knowledge of either effects——

Mr. GRIJALVA. Do you believe during this rule review, given the urgency of the topic right now and the right whales, do you believe that there are opportunities that are going to exist to strengthen that ship strike rule?

Mr. OLIVER. I think the opportunity is there, yes, sir.

Mr. GRIJALVA. OK. I yield back, Mr. Chairman. Thank you.

Mr. HUFFMAN. Thank you.

The Chair now recognizes Mr. Lamborn for 5 minutes.

Mr. LAMBORN. Thank you, Mr. Chairman. I want to thank you and the Ranking Member for having this hearing today. This is an important topic, and so it is good that we are here.

Mr. Oliver, I want to thank you for coming today. As you know, we appreciate the hard work you do for the American people, even

in the face of sometimes reckless accusations or radical science deniers and political opportunists. As we all focus on the right whale today, I wanted to touch on seismic, and try to put the science back into this hearing. And I am glad that the Chairman talked about the need for science. That is always better than emotionalism.

How long have we been conducting geophysical work to find resources in our oceans?

Mr. OLIVER. I don't know the exact answer, sir. But at least 50 or 60 years.

Mr. LAMBORN. OK. I am told 80 years. Does that sound correct to you?

Mr. OLIVER. That is probably more accurate. Yes, sir.

Mr. LAMBORN. OK. Thank you.

Now, I am going to list a few reasons for conducting this important geophysical research. And I want you to just answer yes or no on my list of questions.

Whether or not that geophysical research in the Atlantic Ocean would need an incident harassment authorization, if you are conducting geophysical work to dredge shipping channels, do you need an IHA?

Mr. OLIVER. I think you probably do, but it might be situation-specific.

Mr. LAMBORN. How about researching sea bottom characteristics for offshore wind installation?

Mr. OLIVER. Yes. I believe so.

Mr. LAMBORN. OK. Planning and exploring for sand resources for beach replenishment and rebuilding?

Mr. OLIVER. Again, I think that is correct, but I am not certain on the situation.

Mr. LAMBORN. And my understanding is that it is.

Mr. OLIVER. I have no reason to believe that it is not.

Mr. LAMBORN. Thank you. And how about unexploded ordnance surveys?

Mr. OLIVER. I believe so, yes.

Mr. LAMBORN. OK. Thank you. In fact, we have seen seismic geophysical work in the Atlantic for nearly all these reasons in just the last 4 years.

And Mr. Chairman, I would like to submit for the record a list of these surveys that IHAs have been required for.

Mr. HUFFMAN. Without objection.

[The information follows:]

Submission for the Record by Rep. Lamborn

Issued IHAs for Seismic Activity in the U.S. Atlantic, 2014-2018			
Applicant	**Activity**	**Active/ Expired**	**Year Issued**
Dominion Energy Virginia	Unexploded Ordnance (UXO) Surveys off Virginia for Site Characterization of the Research Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf OCS-A 0497 Lease Area	Active	2018
Bay State Wind LLC	Marine Site Characterization Surveys for Renewable Energy off the Coast of Massachusetts in the Area of OCS-A 0500	Active	2018
Deepwater Wind New England LLC	Marine Site Characterization Surveys for Renewable Energy off the Coast of Rhode Island and Massachusetts in the Area of OCS-A 0486	Active	2018
Garden State Offshore Energy, LLC	Skipjack Wind Project	Active	2018
Statoil Wind U.S. LLC	Empire Wind Project	Active	2018
United States Geological Survey	Geophysical Survey in the Northwest Atlantic Ocean	Active	2018
Scripps Institution of Oceanography	Low-energy Marine Geophysical Survey in the Northwest Atlantic Ocean	Active	2018
Deepwater Wind, LLC	Marine Site Characterization Surveys, Offshore NY	Expired	2017
Ocean Wind, LLC (Ocean Wind)	Marine Site Characterization Surveys, Offshore NJ	Expired	2017
DONG Energy Massachusetts LLC	Geophysical and Geotechnical Surveys Offshore Massachusetts (2016-2017)	Expired	2016
Lamont-Doherty Earth Observatory	Seismic Survey in the South Atlantic Ocean	Expired	2016
ExxonMobil Alaska LNG LLC (AK LNG)	Geophysical and Geotechnical Program in Cook Inlet, AK (2015)	Expired	2015
Lamont-Doherty Earth Observatory	Seismic Survey in the NW Atlantic Ocean Offshore New Jersey	Expired	2015
USGS	Seismic: subbottom, sonar: multibeam, seismic: MCS	Expired	2015
University of New Hampshire	Seismic: subbottom, Sonar: multibeam	Expired	2015
Scripps	Seismic: subbottom, Sonar: multibeam	Expired	2015
Cape Wind Associates	High Resolution Geophysical Survey in Nantucket Sound, MA	Expired	2014
USGS	Seismic Survey in Atlantic Ocean off Eastern Seaboard	Expired	2014
Rutgers University	Seismic: subbottom, sonar: multibeam, seismic: MCS	Expired	2014
USGS	Seismic: subbottom, seismic: MCS, seismic: sonobuoy	Expired	2014
Lamont-Doherty Earth Observatory	Seismic: MCS, multibeam, subbottom CHIRP, OBS	Expired	2014

Mr. LAMBORN. Thank you.

Mr. Oliver, knowing that all this work has been done in just the last 4 years, much less going back 80 years, has it decimated right whale populations in the Atlantic? Or has the mitigation, observer requirements, and strong science that lays at the foundation of NOAA IHA decisions proven successful in allowing us to do the work we need to do, while at the same time conserving the species we need to conserve?

Mr. OLIVER. I believe it is the latter, sir. Yes.

Mr. LAMBORN. And could you explain that, please?

Mr. OLIVER. Well, I believe that, again, as far as we know, the primary source of mortality by far for North Atlantic right whales particularly is vessel strikes and vessel entanglement. And, again,

there is no evidence whatsoever of any direct mortality or serious injury to the right whales from seismic activity.

Mr. LAMBORN. Thank you very much.

Mr. Chairman, I yield back.

Mr. HUFFMAN. The Chair now recognizes Mr. Lowenthal for 5 minutes.

Dr. LOWENTHAL. Thank you, Mr. Chair.

Mr. Oliver, I want to follow up on the questions that Chair Grijalva asked you about the ship strike reduction rule. Maybe we can discuss your thoughts on how it can be strengthened, right now, to talk about strengthening the rules.

In 2008, National Marine Fisheries Service published the ship strike reduction rule, and it imposed a mandatory speed limit of 10 knots per hour on vessels that were 65 feet in length or greater along parts of the Atlantic Seaboard at certain times of the year to prevent these collisions between the ships and the North Atlantic right whales.

They determined that 65 feet was the appropriate length, because that was the categorization that was used to differentiate between motorboats and larger vessels and commercial vessels, and that larger vessels were subject to certain regulatory control, where smaller vessels were not.

But we all know that a vessel of 65 feet or smaller can cause great harm to a North Atlantic right whale. Has the Agency ever considered putting a speed limit in seasonal management areas for vessels that are smaller than 65 feet? And if not, why not? And if you have, where are we in that discussion?

Mr. OLIVER. I honestly don't know, sir, in the original process of establishing those speed restrictions, whether and to what extent we considered vessels less than 65 feet. I think it has something to do with not only vessel size but automated information system AIS tracking that typically is required of all the larger vessels, therefore, our ability to track and monitor compliance with the vessel speed restrictions. So, I think there is a monitoring and compliance aspect to it.

I would agree with you, though, that it makes sense. If we did not carefully evaluate that length threshold in the original rule, it would make sense to me that we should be looking at that in the current review.

Dr. LOWENTHAL. I am glad you will be. But another question is: How successful have you been in terms of actually reducing speed? I think in studies that were prepared for NOAA December 2012, that voluntary speed limits in what are called "dynamic management areas"—they are parts of these areas—have only had limited success in reducing vehicle speed; they are still striking these animals.

And in another study, NOAA has previously stated that there is a high level of noncompliance with these voluntary speed reductions, and that, for example, 95 percent of the ships that tracked in the Great South Channel did not slow down even when it was noted to them that it was a speed advisory due to right whale sailing—they were not slowing down.

If that is the case, why are these restrictions not mandatory? And why are we not enforcing them, then?

Mr. OLIVER. Mr. Congressman, I do think that that is one of the important points that will be assessed in this review, and that is compliance with the rule. I know that we have, in fact, our Office of Law Enforcement has a great deal of information on compliance and violations that will be brought forward in that record.

We have issued a number of very large penalties under this. But I would agree with you that if we identify areas that we believe are critical with regard to this issue of speed restrictions, critical relative to the right whale, that we should be seriously considering whether to make those areas mandatory as opposed to voluntary.

Dr. LOWENTHAL. Thank you. And last, we have had issues on the West Coast, too, off my coast, the Pacific, on whales. And we have a voluntary program in place that I would like to describe to you later or put into the record. But it is based upon recognition.

That is, if those shipping lines and others reduce their speed to a significantly slower speed, we provide them with recognition. And they all agree to do it, and we have lowered the air pollution significantly, especially in Santa Barbara and Ventura County, which were out of compliance.

So, there are ways of doing this. I would hope that we would use this as an opportunity to really slow down ships. Really. Because that is a major danger to the sea life. Thank you.

Mr. HUFFMAN. Thank you.

The Chair now recognizes Mr. Johnson.

Mr. JOHNSON. Thank you, Mr. Chairman, and thank you, Mr. Oliver, for being here.

As you know, the sort of incidental takings that we are talking about here today under the Marine Mammal Protection Act have to be authorized by NOAA Fisheries. One requirement for the taking authorization is that NOAA must find the activity would "have no more than a negligible impact on the marine mammal species," in this case, of course, the right whale.

What are some of the primary considerations you look at when issuing these permits?

Mr. OLIVER. Well, there are a number of things that we need to find. And "negligible impact," I do not have the definition exactly on the top of my head. But it has to not result in long-term population or productivity of the species in question. So, that is a primary consideration.

Mr. JOHNSON. I am interested to know about ongoing requirements once a permit-holder obtains a permit. Do they have to follow requirements, say, if they encounter a protected species while they are engaging in the activity authorized by the permit?

Let's say that the seismic study is going on, and one of the vessels encounters a right whale. What happens then?

Mr. OLIVER. Yes, sir. There are shutdown requirements—if a right whale is detected within 1½ kilometers of the vessel, they are required to immediately shut down their air guns.

Mr. JOHNSON. How long does the shutdown take? What is the procedure from that point?

Mr. OLIVER. I don't know the exact answer of what the criteria is for when they can go back up. But I suspect if the right whale subsequently exits the area and is not detectable within 1½ kilometers, that at some point the activity could resume. I

apologize, I don't know the exact time interval. That is something I would be glad to look into and get back to you on.

Mr. JOHNSON. I guess the point is that there are some very reasonable restrictions in place. And some of our friends on the activist side want to imply that operators are just out there wreaking havoc in the seas, and that is not the case, I think.

Let me ask you another question. In your testimony, you talk about ongoing collaboration with Canada. My understanding is that in 2017, there were a total of 17 observed right whale deaths, but 14 of those occurred in Canadian waters. Can you expand on some of the work you are doing with Canadian regulators to minimize the harm they are causing to the right whale population?

Mr. OLIVER. Yes, Mr. Congressman, I can. And following that 2017 event, we were very pleased that Canada subsequently last year actually implemented some measures, both with regard to shipping and with regard to gear entanglement. It was very good progress on their part.

We collaborate and meet monthly with representatives from the Department of Fisheries and Oceans as well as Transport Canada on the shipping side. We established a bilateral right whale working group to discuss measures that both countries could consider and increase our coordination. We participate in aerial surveys with their team in the Gulf of Saint Lawrence. And they in turn participate on our right whale recovery implementation team.

And those are just a few of the ways that we interact at the international front. And I would just add generally that following that event in 2017, the heat, if you will, has turned up on that collaboration and on both of our countries' efforts to particularly seek ways to minimize gear entanglement. So, it has really redoubled our efforts in that regard.

Mr. JOHNSON. I was looking into this, and I was struck by the fact that I was in the second grade the last time there was a comprehensive geological seismic study for the Atlantic Coast. It was over 40 years ago. Has that technology advanced from then to now, so that we can get more accurate information while being less intrusive to marine life?

Mr. OLIVER. I believe it has. And I am not an expert on it, but that is certainly my understanding, and from the information that we have received from some of the seismic oil and gas companies.

Mr. JOHNSON. I appreciate your being here, and I yield back.

Mr. HUFFMAN. The Chair now recognizes Mr. Neguse for 5 minutes.

Mr. NEGUSE. Thank you, Mr. Chair, and thank you, Mr. Oliver, for appearing before us today. I represent the great state of Colorado, and although we are a landlocked state, we certainly care very deeply about our oceans and the species that call our oceans home.

Also, we have a number of people in my district in particular, Colorado 2nd Congressional District, who are very active in this regard. The Inland Oceans Coalition, which has chapters across the western United States, including at the University of Colorado Boulder and Colorado State University in my district, was founded in Colorado and works to build enthusiasm around marine biology and acknowledgement of the direct impact on the cycles of life in

the oceans that are downstream from us. Another example is the Oceans First Institute in Boulder, Colorado, which promotes conservation in future generations by connecting youth with the wonders of the ocean.

I want to talk about some of your testimony today, Mr. Oliver. Just taking a step back, my understanding is that new births of North Atlantic right whales have slowed compared to the early 2000s, and only about 100 breeding females remain in the population.

And the only known calving ground for the North Atlantic right whale is off the southeast U.S. coast. And, of course, as we have talked about in this hearing, the Federal Government has now granted permits for nearly 850 combined days of seismic surveys for oil exploration in that precise area.

What are the potential impacts of the seismic surveys on mothers and calves, which are key to the population growth?

Mr. OLIVER. There are a number of critical habitat areas, including that calving area, in which no activity would be allowed. Those would be closed to seismic activity under the mitigation measures of the authorization that we have granted.

Mr. NEGUSE. So, you believe the permits that have been granted will have no impact on the ability of the right Atlantic whale?

Mr. OLIVER. We believe they will have a negligible impact.

Mr. NEGUSE. A negligible impact? OK. Well, let me take it this way. My understanding is that in 2017, these same permits were denied by the Bureau of Ocean Energy Management, by the BOEM. Is that right?

Mr. OLIVER. My understanding is they put the process on hold, and——

Mr. NEGUSE. Well, I will quote, I have a quote here. Perhaps this will be educational. "In early 2017"—this is according to the BOEM in denying similar permits—concluding that the "value of obtaining the geophysical and geological information from new air gun seismic surveys in the Atlantic does not outweigh the potential risks of those surveys' acoustic pulse impacts on marine life." Those are not my words, they are the BOEM.

What has changed since 2017? The science has not changed. Right?

Mr. OLIVER. Well, Congressman, I cannot speak to why BOEM did or did not deny the permits. Our role in this——

Mr. NEGUSE. They did deny the permits, just for the record. But I am happy to provide you with that——

Mr. OLIVER. I understand. I don't know why they did that.

Mr. NEGUSE. Well, I just explained to you. The quote, they denied the permits because ultimately, the benefits to these five oil and gas companies were outweighed by the risks to this endangered species. And since that time, the science certainly has not changed. The status of the species certainly has not changed; it is more threatened, not less. It seems that the only thing that has changed since that time is the politics of it.

And this is why it is very frustrating, because most of the issues that we deal with are very partisan. But this happens to be an issue that has bipartisan support. Let me give you just a few of the

stakeholders in the region who have expressed concern or outright opposition to the granting of these permits.

The governor of Florida, Republican. The governor of Georgia, Republican. The governor of South Carolina, Republican. The governor of Maryland, a Republican. The governor of Massachusetts, a Republican. All right? In addition to a variety, of course, of Democratic governors, 240 East Coast state municipalities, over 1,500 local, state, and Federal bipartisan officials.

There are a litany, a plethora, of experts and folks in these communities who have said that this is not a prudent thing to do. And I am struggling to understand why NOAA, which is obligated under the law to consult with the BOEM as it grants these permits, would be willing to take this risk. I guess that is my last question for you, Mr. Oliver.

Mr. OLIVER. I would answer, Congressman, that our role in this, under the MMPA, is to not authorize the surveys themselves, but authorize the marine mammal take that might occur incidental to these surveys with the necessary mitigation, reporting, and monitoring requirements that we believe would be a negligible impact. But that is different than actually——

Mr. NEGUSE. Again, you keep on referencing the word "negligible." I think it is important—we can get lost in the technical language. These air gun blasts happen every 10 seconds for hours on end, for weeks on end, to a species that calls the ocean home.

There are literally bombs going off for those animals every 10 seconds of every hour of every day for prolonged periods of time. I do not think that is a negligible impact, and I think the science makes clear that is not the case. And with that, thank you, Mr. Chairman.

Mr. HUFFMAN. I thank the gentleman.

The Chair now recognizes Mr. Fulcher for 5 minutes.

Mr. FULCHER. Thank you, Mr. Chairman.

Mr. Oliver, I represent a region in the state of Idaho, also a landlocked state, and will just tell you right up front, my level of expertise on the right whale is quite negligible. I had to do a little bit of homework on this, and I want to share with you what I found. I think, for the most part, it tends to line up with what you were saying.

But it appears to me that the primary habitat for this species is three locations. There is the Atlantic, North Atlantic, North Pacific, and the Bering Sea. And at least according to the information that I am finding, the population fluctuation, up or down, doesn't seem to be different in any of those regions. And, by the way, the ocean traffic has been constant on both, with the highest ocean traffic, actually, in the Atlantic.

I have been intrigued by the seismic conversation. And most of that activity takes place in the Gulf of Mexico, which this is not potentially part of that habitat, but also some in the Atlantic. Yet, there doesn't appear to be any difference in the population trend. You did talk about this, but I just need to hear you re-edify that.

What is the biggest impact negatively on the population of these animals?

Mr. OLIVER. Congressman, certainly in the case of the North Atlantic right whale—and there may be some differences in the population trajectories of the different species; as we noted earlier, other whales on the East Coast are increasing at a rate of 3 to 5 percent in many cases—by far the primary sources of mortality are vessel gear entanglement, followed by vessel strikes. Those are the two sources of right whale direct mortality and serious injury.

Mr. FULCHER. Just for the record, the data that I see is in agreement with that. Do you have anything specific in your data that indicates that the seismic activity is—I just don't see it where I am looking. And I am wondering if you have any data on that.

Mr. OLIVER. Well, there is certainly information, Congressman, that seismic activity, acoustic activity, air guns, however you want to characterize it, does have sublethal effects on various activities of marine mammals, including the North Atlantic right whale.

It can affect their behavior, their movements, their migrations. It can affect their feeding behavior. It can affect their breeding behavior. And collectively, those sublethal effects are precisely why we prescribe what we believe are fairly significant mitigation requirements on that seismic activity.

Mr. FULCHER. Mr. Oliver, then if that is the case, why wouldn't there be more of a fluctuation in the population, or decline in this case, in areas where most of that is happening today?

Mr. OLIVER. I can't answer that question specifically. Again, we don't believe that seismic activity is a source at all of direct mortality or serious injury. It is hard to tease apart what could be longer-term effects on a different species of whale. But, again, if your question was, does this seismic activity result in mortalities of whales, the answer, we believe, is it will not.

Mr. FULCHER. Mr. Oliver, thank you for being here and for your testimony.

Mr. Chairman, I yield back.

Mr. HUFFMAN. The Chair now recognizes Mr. Levin for 5 minutes.

Mr. LEVIN. Thank you, Chair Huffman, and thank you, Mr. Oliver, for joining us today.

I think we all agree how important it is to listen to scientists when developing public policy, particularly in an area like this where certain industries may have an outsized influence. Mr. Oliver, your agency has been inconsistent in its approach to the rules on sounds in our ocean.

First, in the Gulf, your rules say that some sounds below 160 decibels can negatively impact whales. Yet, in the Atlantic, you allow all sounds up to 160 decibels, some of which would not be allowed in the Gulf. A hundred sixty decibels, as you may know, can rupture human eardrums.

So, my question for you, Mr. Oliver, is: Did any career scientists or other career staff object to the differences in these policies? Did they write any memos or e-mails to voice their concern? Or did they express their concerns orally?

Mr. OLIVER. Congressman Levin, if I understand your question correctly, this relates to the different application of measures in the Gulf and the Atlantic. While there is some desire for consistency across regions, there are very significant differences in both the

bathymetric aspects of those two oceans and very different species involved.

And different whale species, I can't cite the specific species and the decibel ranges that they are sensitive to, but different species that exist in those two different oceans are very sensitive to different bands of decibel and megahertz. So, what works with some species does not work with others.

Mr. LEVIN. Mr. Oliver, with respect, I don't think you answered my question. Again, did any career scientists or other career staff object to the differences in these policies?

Mr. OLIVER. I'm not certain I understand what policies you are referring to. But the answer is no.

Mr. LEVIN. I find that hard to believe, seeing as it is such a significant change in policy, to allow sounds up to 160 decibels in the Atlantic but not in the Gulf. That is the correct policy. Right?

Mr. OLIVER. My understanding is those differences are based on the scientific expertise of career staff, who recognize the appropriateness of those different applications.

Mr. LEVIN. And can the Committee see any evidence of that disagreement with scientific backup? Can that be provided to the Committee?

Mr. OLIVER. We will certainly provide you all the scientific information we used in making those determinations. Yes, sir.

Mr. LEVIN. That would be helpful. And Mr. Oliver, this was not the only controversial decision the agency made. You also decided not to look at the cumulative impacts of the authorizations you issued. Similar question: Did any career scientists or other career staff object to the failure to evaluate cumulative impacts of multiple Incidental Harassment Authorizations, or IHAs?

Mr. OLIVER. No, sir. Not to my knowledge.

Mr. LEVIN. I also find that very hard to believe, given the significance of the policy.

Were there any other aspects of the decision to issue the Incidental Harassment Authorizations that caused dissent within the agency? And if there were, what was the nature of that dissent?

Mr. OLIVER. No, sir. Not to my knowledge.

Mr. LEVIN. Mr. Chairman, I am concerned about how the decision to endanger the right whale was made. I believe the Committee should insist on the production of any documents held by the agency that express concerns about the impact of the decision on the right whales.

We will not be able to know the true basis for the decision unless we get these documents, and I find it incredibly hard to believe that there was not significant internal debate.

So, I look forward to the production of those documents to the Committee, Mr. Oliver, and I will yield back the balance of my time.

Mr. HUFFMAN. Thank you. And I believe I heard you, Mr. Oliver, agree to share those documents with the Committee. Did I hear you correctly?

Mr. OLIVER. Sure. Yes, sir.

Mr. HUFFMAN. Thank you very much.

The Chair now recognizes Mr. Hice for 5 minutes.

Dr. HICE. Thank you, Mr. Chairman.

Mr. Oliver, I want to thank you for being here, and recognize your expertise in so many different groups and organizations that supported you being appointed to this position, and the high level of professionalism you bring to it.

As we are discussing the right whale, I am from Georgia, and of course this is the official marine mammal of Georgia. And the right whale has calving grounds in the waters off the coast of our state. And these are beautiful mammals and draw a great deal of tourism. People going to Jekyll Island, Tybee Island, and the like go out looking for dolphins and whatever, but all the while keeping their fingers crossed that perhaps they will have an opportunity to see a right whale along the way.

Why is it that the right whale is only off the coast of Georgia for certain months, as I understand it, between November and April?

Mr. OLIVER. I have to admit, sir, among my expertises, I am not a cetacean expert. That is their typical migration pattern. As far as I know, it has been their pattern for hundreds if not thousands of years. I don't know exactly why they are there at that time of year, but they seem to be there pretty much every year. I would be happy to——

Dr. HICE. Right. Because you said it, it is a migratory pattern. It is what they do. They come there and they leave. And it is something they have been doing for hundreds or thousands or however long number of years. It is the pattern. It is what they do.

So, when there is a migratory animal such as this, it means that they are there certain times of the year and they are not there certain times of the year, as a general rule. Is that correct?

Mr. OLIVER. Yes, sir.

Dr. HICE. All right. So, would this be part of the explanation why NOAA Fisheries issued an incident authorization to the company Deepwater Wind to survey off the coast of Rhode Island in order to build Block Island Wind Farm?

Mr. OLIVER. Yes, sir.

Dr. HICE. OK, so the reason, just to be sure, is because it would be an incidental harassment, which means what? Can you explain what an Incidental Harassment Authorization is?

Mr. OLIVER. What it essentially means is you cannot intentionally harass. But you can, incidentally to the activity being proposed, incidentally interact, harass, in this case the acoustic signals from the air guns, if we can find again that it has an overall negligible impact on the species, and we impose appropriate mitigation monitoring and enforcement standards to minimize that interaction.

Dr. HICE. Right, so you are minimizing the potential problems because in this case you have a migratory mammal that is—and so you try to exercise those sounds, more than likely, when they are not present. Correct?

Mr. OLIVER. Yes.

Dr. HICE. OK. That makes sense. Let me land where I am going here. As I understand it, there is no real unique difference between the needs of renewable sources and oil and gas development when you are coming to survey the shore, or the ocean bottom. Is that correct?

Mr. OLIVER. Again, I am not an expert on hydroacoustics. There may be some differences in the sound, the acoustic signal, between seismic for oil and gas versus seismic for siting a wind facility. But I think that essentially, they are very similar.

Dr. HICE. If you are trying to determine the ocean floor, it does not matter what you are surveying the ocean floor for, the purpose, whether it is renewable energy, or oil and gas. If you are surveying the floor, it is basically the same technology for either. That is my understanding. Is that your understanding?

Mr. OLIVER. Yes. My understanding is they are very similar. Some may be shooting for a deeper signal, in the case of oil and gas, than siting a wind turbine, for example, which may not have to go down as deep to know what you want to know. But——

Dr. HICE. So, we should be able to pursue all of the above safely?

Mr. OLIVER. I believe we can. And I don't believe our agency has ever denied an application for that type of activity.

Dr. HICE. OK. Thank you. I yield back.

Mr. HUFFMAN. Thank you, Mr. Hice.

The Chair asks unanimous consent to allow the gentleman from Massachusetts, Mr. Keating, to sit at the dais during some of the testimony.

Without objection, it is so ordered. And the Chair now recognizes Mr. Sablan.

Mr. SABLAN. Thank you very much, Mr. Chairman, for holding this hearing. And thank you for Mr. Oliver and the other witnesses for joining us and sharing.

I have one question, Mr. Oliver. NOAA currently protects, again, critical habitat for right whales, which includes the feeding areas and calving grounds. However, the whales twice-yearly migratory routes through the mid-Atlantic, which connect these two habitats, are not protected.

Does NOAA Fisheries have plans to ensure right whale migratory routes are officially recognized as critical habitat and establish the necessary protections for their migratory routes in the mid-Atlantic?

Mr. OLIVER. Congressman, my understanding is that it is typically the southern region where they calve, which has not changed much. Some of their activity, on the other hand, up north has moved northward and seaward. So, there are some changes occurring in their movement patterns, and that is what is critical for us to understand.

But my understanding is the migration pattern that you are referring to, at the time it occurs and at the time they are in those waters, is why we have the mitigation measure that we put in place. And there are critical habitat areas within that, including the calving grounds, that are always closed.

But it is my understanding that the mitigation measures were intended to address that very issue of where the whales are and when.

Mr. SABLAN. Yes. Let me just ask, Mr. Oliver, a yes or no answer. Do you have oversight authority over Westpac? This is not a right whale question. But do you have authority over Western Pacific Fisheries Council?

Mr. OLIVER. I don't know what you mean by "authority over."

Mr. SABLAN. I mean do you, do they have supervisory——

Mr. OLIVER. We don't have direct supervisory authority over the councils. They are not employees of——

Mr. SABLAN. OK. Just a question. Thank you.

At this time, I yield the remainder of my time to the Chairman of the Subcommittee.

Mr. HUFFMAN. Thank you, Mr. Sablan. I will not take the full amount of time.

But, Mr. Oliver, I do want to ask you this. You mention that you are in the middle of a reconsultation on the existing biological opinion for the North Atlantic right whale. Correct?

Mr. OLIVER. Yes, sir.

Mr. HUFFMAN. You only do a reconsultation if the existing biological opinion protections are not working. Is that not fair to say?

Mr. OLIVER. Well, there are a number——

Mr. HUFFMAN. If everything is just fine and the species is on the path to recovery, you do not have to do a reconsultation.

Mr. OLIVER. This is also the subject, sir—apologies—of ongoing litigation. So, I am a little bit limited in how I can respond.

Mr. HUFFMAN. All right. But it is fair to say that there is strong reason to believe that existing protections that are in place under the biological opinion are not putting the species on a path to recovery. Would you not agree?

Mr. OLIVER. Well, I would agree that there were perhaps deficiencies in the biological opinion itself, which may be a little bit separate issue than the measures that we currently have in place. I think that based on the results of this biological opinion, it may well indicate that we need to take additional measures.

Mr. HUFFMAN. Very good. And the downward trajectory of the population would also suggest that this is a time for more protection, not less. Would you not agree?

Mr. OLIVER. Yes, sir. Protection from the primary sources of mortality, certainly.

Mr. HUFFMAN. The mission of the National Marine Fisheries Service is not to promote fossil fuel energy dominance, is it?

Mr. OLIVER. That is correct.

Mr. HUFFMAN. The prior administration under the same facts, under the same science, at a time when the population was actually doing better than it is today, found that the risk of extinction from these five companies doing seismic testing to make money on oil and gas development was vastly greater, outweighed the monetary interests of the companies. They said no to the oil and gas industry.

I am going to ask you a question that I realize is without any precedent in this administration. But what if you had said no in this administration to the oil and gas industry, as the previous administration was prepared to do under the same facts and the same science? How long would you have kept your job?

Mr. OLIVER. I don't know, Mr. Chairman. I never contemplated that. I contemplated our agency——

Mr. HUFFMAN. Do you think you would be sitting here today? Do you think you would be sitting here today if you had said no to the oil and gas industry?

Mr. OLIVER. I don't know, sir.

Mr. HUFFMAN. Fair enough.

The Chair now recognizes Mr. Cunningham from South Carolina.

Mr. CUNNINGHAM. Thank you, Mr. Chair. My name is Joe Cunningham. I represent South Carolina's 1st District, which is a coastal area, from Charleston all the way down to Hilton Head.

It is fair to say that seismic air gun blasting is extremely disruptive and loud. Correct?

Mr. OLIVER. I didn't hear the last——

Mr. CUNNINGHAM. It is fair to say that seismic air gun blasting is extremely loud and disruptive. Is that correct?

Mr. OLIVER. I don't know exactly how loud it is. I have never actually directly experienced it myself. And when you say "disruptive," I cannot answer that question unless you elaborate on what you mean by—disruptive to what?

Mr. CUNNINGHAM. OK. Let's say, do you think the sound of a washing machine is loud or disruptive?

Mr. OLIVER. Not particularly.

Mr. CUNNINGHAM. OK. What about an air horn?

Mr. OLIVER. You are getting there.

Mr. CUNNINGHAM. OK. Mr. Chair, I would ask for unanimous consent to sound an air horn in Committee.

Mr. HUFFMAN. Is there objection to the gentleman's demonstration?

[No response.]

Mr. HUFFMAN. Without objection, the gentleman——

Mr. OLIVER. Mr. Chairman, I would assume that it will annoy us, but it will not kill us.

Mr. HUFFMAN. Hearing no objection, the gentleman may demonstrate.

Mr. CUNNINGHAM. Thank you. I would like to give anyone an opportunity to leave if they would find it bothersome.

Mr. OLIVER. Again, Mr. Chairman, I suggest that opportunity exists for every whale and other little critter in the ocean.

Mr. HUFFMAN. I don't think they receive advance notice of the seismic testing in cetacean language, but——

Mr. OLIVER. That is not correct. You told us that they get 10 seconds' interval between every blast. I think that would be plenty of time to go to the next room or section of the ocean.

Mr. HUFFMAN. The gentleman may proceed. Thank you.

[Mr. Cunningham sounds air horn.]

Mr. CUNNINGHAM. Was that disruptive, Mr. Oliver?

Mr. OLIVER. Sir, it was irritating, but I did not find it particularly disruptive.

Mr. CUNNINGHAM. What about, say, every 10 seconds, like systematic air gun testing goes on for, for days? Weeks? Months?

Mr. OLIVER. If I were that close to it, yes, probably.

Mr. CUNNINGHAM. Yes. What if you depended on sound for hunting your food and for communication? Do you think it would be disruptive?

Mr. OLIVER. At a distance of 20 feet, yes, it would be.

Mr. CUNNINGHAM. How much louder do you think seismic air gun blasting sounds than this air horn you just heard?

Mr. OLIVER. I honestly don't know.

Mr. CUNNINGHAM. Take a guess. Ten times?

Mr. OLIVER. At a distance of how far?

Mr. CUNNINGHAM. Well, say you are within a reasonable distance. Say you are within a quarter of a mile. Is it 10 times? Is it 25 times?

Mr. OLIVER. I honestly don't know.

Mr. CUNNINGHAM. Can you take a guess?

Mr. OLIVER. No.

Mr. CUNNINGHAM. A hundred times? Do you think it is a thousand times louder?

Mr. OLIVER. I doubt it.

Mr. CUNNINGHAM. You doubt it? What if I were to tell you it is 16,000 times louder than what you just heard here? Can you see how that would be impactful on marine species, mammals?

Mr. OLIVER. I do, which is why we put mitigation measures in place to minimize the proximity of that activity with the whales in question.

Mr. HUFFMAN. Do you think you can cure all of the effects that come from seismic air gun blasting to these species that it is impacting?

Mr. OLIVER. I don't know what the effects are that we are curing. Sorry.

Mr. CUNNINGHAM. Well, such as the killing of our species?

Mr. OLIVER. I guess, Mr. Chairman, if that was a question, I will repeat what I said earlier. There is absolutely no evidence that these sounds and activities have ever killed or seriously injured a marine mammal, or a right whale.

Mr. CUNNINGHAM. You have heard earlier testimony how various states along the Eastern Seaboard, including South Carolina, are adamantly opposed to offshore drilling. Correct?

Mr. OLIVER. Yes.

Mr. CUNNINGHAM. OK. How do you feel about imposing seismic air gun blasting, which is impactful to marine species, in search for oil and gas and which the residents and citizens of South Carolina do not even want?

Mr. OLIVER. Congressman, our role under the MMPA is to either authorize the activity or not based on a number of findings that do not include a popular vote.

Mr. CUNNINGHAM. Do you think South Carolina has a right to determine what happens off its shorelines?

Mr. OLIVER. Certainly, within certain distances that perhaps envelop state waters.

Mr. CUNNINGHAM. But outside state waters, you don't think they have any decision whatsoever as to what happens off their shorelines and what could ultimately wash up on our beaches?

Mr. OLIVER. I don't write the laws that dictate where states' rights, where states' authorities versus Federal authorities lie.

Mr. CUNNINGHAM. I am not asking for your legal interpretation. I am just asking your personal opinion about this.

Mr. OLIVER. I don't have an opinion on that.

Mr. CUNNINGHAM. You don't have an opinion?

Mr. OLIVER. No, sir.

Mr. CUNNINGHAM. OK. Would you like to know or have an opinion about what happens within your neighborhood or your state?

Mr. HUFFMAN. I think we are going to end with that rhetorical question. The gentleman's time is expired.

Mr. CUNNINGHAM. I appreciate your time, Mr. Oliver. Thank you.

Mr. HUFFMAN. The Chair now recognizes Mr. Beyer of the great state of Virginia, also on the migratory route of the North Atlantic right whale, for 5 minutes.

Mr. BEYER. Mr. Chairman, thank you very much for including me and for allowing me some time.

This is a very important issue to me. All of our Virginia coastal communities are united against the oil and gas and against the seismic testing. And I am going to be reintroducing the Atlantic Seismic Air Gun Protection Act today to establish a moratorium on geological and geophysical activity related to oil and gas exploration and development in the Atlantic Ocean.

If I can—will my friend from South Carolina yield for a question?

Mr. HUFFMAN. Without objection.

Mr. CUNNINGHAM. No objection.

Mr. BEYER. Could you tell me what the decibel level on the air horn was?

Mr. CUNNINGHAM. On the air horn, it is 120 decibels.

Mr. BEYER. Great. Thank you very much.

And by the way, Mr. Oliver, on this sound traveling, we know that subsonic sound travels 2,500 miles in the ocean, which is Washington, DC all the way to San Francisco. So, you cannot escape, in 10 seconds, that 2,500 miles.

My understanding is that your agency took the position that the North Atlantic right whales are not harassed by sounds unless they are episode to a sound at the level of 160 decibels or higher. And obviously, every 10 decibels, I believe, is a doubling in the sound volume.

But in the Gulf of Mexico, your same agency did only 120 decibels, which is many, many times. Why the difference?

Mr. OLIVER. Again, a similar question came up earlier. I think, while there is some desire to maintain a consistency in how we authorize issue authorizations in different bodies of water, they are very different ocean conditions, bathymetry, and most importantly, very different species we are talking about.

And the different whale species have different vulnerabilities or different typical acoustical patterns that they operate within. So, different decibels affect different whale species differently.

Mr. BEYER. But we can establish that 160 decibels is incredibly loud. In fact, that is twice as loud as what is necessary to rupture the human eardrum.

The Republican objection to this seems to hang on two things that happened in the Obama administration. In 2014, NMF said, "Today there is no evidence serious injury or death or stranding by marine mammals can occur from exposure to air gun pulses." And then in 2014, BOEM said, "To date there has been no documented scientific evidence to adversely affect marine animal populations."

Since you are not on the next panel, let me just quote from some of the abundance of contrary evidence. For example: "Right whales as well as many marine animals are highly dependent on a naturally quiet ocean for basic life functions."

"Protecting right whales protects entire ocean ecosystems."

"Whales act as incidental farmers of the seafood, capturing food at depth and releasing nutrients at the surface."

"Right whales, the acoustics will increase the likelihood of mother-calf separations, the likelihood of acoustic communication between whales," on and on and on.

None of these are individual right whales being killed. But they are all whole-population impacts that affect calving, migrations, life span.

"This is not about acute physical harm to an individual, rather, the cost to a marginally surviving population as a result of aggregate chronic noise."

"I find the idea that whales are more like us than most people—cults or dialects, individual voices, family trees, long-term social structures, that we owe them more than treating them as collateral damage."

How do you reconcile this abundance of science—and you have probably seen the many, many, many references—with the NMFS and BOEM decisions in 2014?

Mr. OLIVER. I am not sure I understand what specific 2014 decisions you are referring to, Congressman. But we have, as I mentioned earlier, I don't believe our agency has ever, across any administration, not approved an Incidental Harassment Authorization.

Depending on the activity and depending on the species, there are different mitigation conditions attached to those authorizations. But——

Mr. BEYER. Let me ask you—can you appreciate that there is a significant difference between a right whale not washing up on the beach, being killed by a seismic blast, and the population impacts of chronic noise abuse over time?

Mr. OLIVER. Yes, I can, Congressman. And we have some of the finest marine mammal scientists, experts, in the world that work on these authorizations, both in the Gulf of Mexico and on the Atlantic Coast. And they know well more than I what the different whale species tolerate and what the appropriate mitigation is for those. And those are the same people that worked on these authorizations.

Mr. BEYER. Mr. Chair, I yield back.

Mr. HUFFMAN. Just a note for the record. My pregnant committee consultant to my left noted that after Mr. Cunningham did his seismic air gun demonstration, her baby began kicking. So, perhaps a data point for you to consider, Mr. Oliver, as we go forward.

[Laughter.]

Mr. HUFFMAN. The Chair now recognizes Mr. Keating for 5 minutes.

Mr. KEATING. Thank you, Mr. Chairman. I thank you and the Ranking Member for allowing me a few minutes to speak. And I thank you, Mr. Chairman, for prioritizing this issue so early in this session, and for your own experience, which I know full well, even with Massachusetts, the studies you have done in this regard. And I do want to talk about that.

And I do want to mention that in terms of Mr. Oliver's comments about minimization, the minimization we are concerned with is the

minimization of the population of the right whale, the North Atlantic right whale, which is down to approximately 422 whales right now.

This is an existential issue regarding their species. And it is that critical. So, where is the trade-off? The trade-off is, Number 1, trying to do something positive, as my colleague Representative Moulton has, which I am joining him as original co-sponsor of his bill, SAVE Right Whales Act of 2019, where we are marshaling resources to try to protect the species.

And the trade-off on the other side is oil and gas exploration in our oceans, and a product that we are exporting now around the world, that we have plenty domestically to deal with. And the trade-off is not even close. And we are just dealing it through the lens of the right whale. There is a "canary in the coal mine" effect possible with the right whale and their diminishing species, and the effects on the rest of the ocean.

And representing one of the largest coastal areas in the United States and an area that has dealt extensively with this issue, I wish I had in front of me a picture. It is a picture that I have seen at the Center for Coastal Studies in Provincetown, Massachusetts. It shows a very brave person getting in a very small vessel up against a whale, trying to disentangle that whale, risking their lives to do that. It is an extraordinary picture.

That is what we should be about. That is what our values, in terms of our environment and protecting our environment, are about. And if we are talking about trade-offs in economic factors, I think I can speak all the way for my colleagues, Virginia, the West Coast, to here. In my district, if you want to just put this on economic terms, it is not even close, either.

Endangering our coastline and its resources would have devastating impacts economically on my area in particular. This is not even close. We should not even be discussing this. But we should be marshaling our resources as SAVE Right Whales Act of 2019 in terms of protecting them. We should be here in Congress giving that same heroic effort to preserve the North Atlantic right whale that those people are doing on those very small vessels, where they can be overturned in a moment.

So, Mr. Chairman, I don't think I will advance this anymore by posing questions. I think the answers are altogether too obvious. And I commend you for having the hearing so that we will have the opportunity to let Congress and let the American public realize that we are making these kinds of trade-offs that are not even close.

I yield back.

Mr. HUFFMAN. I thank the gentleman.

The Chair now recognizes Mr. Webster of Florida.

Mr. WEBSTER. Thank you, Mr. Chair. I appreciate the opportunity.

Along that line, the population of great white whale, there is also an increase in the population of sharks. Administrator Oliver, there is a movement that has been tracked, and that is headed from the Massachusetts area, down to Florida. And there are a lot of predators that are moving in, and prey on white whale calves, which are in that area.

And I am just wondering if these sharks, who are preying on these calves, are any concern. And is there anything being done about that, or is there anything we could do about that?

Mr. OLIVER. Congressman, thank you for the question. That is a good question, one that I don't know the answer to. It is an intriguing question because I know up on the North Pacific, with the endangered Steller sea lion, we have had a lot of issues and questions with regard to the effects on that population of killer whale predation.

So, I don't know offhand of any documented evidence of right whale calves being taken by sharks. But I was at South Atlantic Council meeting earlier this week and heard from a number of fishermen. They are seeing way more and way bigger sharks than ever, to the fact that they are taking fish off their lines on a routine basis.

So, given that there are more and bigger sharks, apparently, out there, I think you raise a good question. And I would probably want to get back to my expert people and find out whether we have any documentation of shark predation.

Mr. WEBSTER. There are several proposals out there about sharks, fishing, and even the finning of sharks. And one of the proposals is to just eliminate any shark fishing. And if this is true, and there is a lot of documentation from NOAA about the migration of these predators down into the Florida area, even around to the Gulf, to me I would propose an idea of trying to draw in the international fishing industry into taking our more conservation-style treatment of sharks and yet still not totally prohibiting the fishing of sharks.

And I am just wondering if there is a correlation between that and the number. And is it going to change? If these predators are coming to Florida, and if their prey is an infant calf, then we are doing great harm to the white whale population, I believe.

Would you see a correlation between those two?

Mr. OLIVER. Again, Congressman, I don't know that there is any correlation between the two. I would say that in cases where particular shark species warrant protection, we will do our best to do that. But we also support sustainable harvest of shark species where there is a sustainable harvest level to be had.

Mr. WEBSTER. Thank you very much. I yield back.

Mr. HUFFMAN. Will the gentleman yield his final 40 seconds for a followup?

Mr. WEBSTER. I will.

Mr. HUFFMAN. Mr. Oliver, you have said that seismic air blasting can have sublethal effects on right whales. Right?

Mr. OLIVER. Yes.

Mr. HUFFMAN. And that can include disrupting the communication patterns that allow a mother and a calf to be together? That is one of the ways in which whales communicate, through ocean sound. If one is concerned about shark predation that is limited to baby right whales, there is no shark in the ocean big enough to go toe to toe with a mother right whale. Correct?

Mr. OLIVER. I believe that would be true.

Mr. HUFFMAN. So, if we are concerned about shark predation on right whales, we should be concerned about seismic air blasting that causes mothers and calves to be separated in the ocean.

With that, I yield back. The Chair recognizes——

Mr. WEBSTER. Well, would the gentleman yield his——

Mr. HUFFMAN. There is no extra time.

The Chair recognizes Mr. Moulton.

Mr. WEBSTER. Are we operating under a 6-minute rule now, Mr. Chairman?

Mr. HUFFMAN. I was using the gentleman's——

Mr. WEBSTER. You accorded yourself 6 minutes.

Mr. HUFFMAN. No.

Mr. WEBSTER. You accorded——

Mr. HUFFMAN. The gentleman is out of order. I was using the time yielded to me specifically——

Mr. WEBSTER. And you stopped the clock when you borrowed time from another Member. And that is getting a little tiresome.

Mr. HUFFMAN. The gentleman is incorrect and out of order.

The Chair recognizes Mr. Moulton for 5 minutes.

Mr. MOULTON. Mr. Chairman, by even the most generous estimates, there are fewer than 422 right whales left in the ocean. Humans have killed nearly every right whale in existence through our direct and indirect actions over the past two centuries.

And, today, we are at a crossroads. We have a choice. We can be the generation that saves the right whale or the generation that allows their extinction. The right whale's fate is literally in our hands, in the hands of the members of this Committee and this Congress.

I want to thank the Committee for having this hearing today and showing their commitment to the right whale, which in turn is a commitment to my region's economy and identity. Let's not miss this unique moment.

Last night with Mr. Huffman, Mr. Rutherford, Mr. Keating, and Mr. Posey, I reintroduced the SAVE Right Whales Act. Mr. Chairman, few people in the history of the Earth have had the ability to help a species survive like this.

From the passenger pigeon to the western black rhinoceros, humans have driven the extinction of iconic species through centuries of choices. It was a choice to hunt the right whale to near extinction. It was a choice to jeopardize the right whale by drilling off our coasts. Let's be the generation of leaders that chooses to bring the right whale back from the brink.

Massachusetts is leading the way. Our bill has the support of scientists like Dr. Scott Kraus from the New England Aquarium, a group leading the charge. He will speak with you shortly. It has the support of lobstermen and other members of the Cape Cod Commercial Fishermen's Alliance, who know that the fate of our economy in Massachusetts is directly linked to the health of our oceans and the species that live in them.

And the SAVE Right Whales Act has the support of the folks who speak for the whales and so many other iconic species, groups like the Natural Resources Defense Council and the Defenders of Wildlife.

So, Mr. Chairman, thank you for your leadership, for your support of this bill in the past, and for prioritizing this hearing in the new Congress. Let's pass the SAVE Right Whales Act, and arm us with the funding we need to be the generation of humans that saves the right whale.

Thank you, Mr. Chairman, and I yield back.

Mr. HUFFMAN. I thank the gentleman. With that, we will thank and excuse Mr. Oliver. Thanks very much for your testimony. We will bring forward our second panel.

While the panel is coming forward, I will go ahead and begin the introductions.

Our first witness will be Dr. Scott Kraus, the Chief Scientist of Marine Mammal Conservation at the New England Aquarium.

Next will be Dr. Sterling Burnett, a Senior Fellow and Managing Editor of Environment and Climate News at The Heartland Institute. And last we will have Dr. Chris Clark, who is a Visiting Senior Scientist at the Bioacoustics Research Program at Cornell Lab.

Let me just remind the witnesses in the second panel that under Committee Rules, they must limit their oral statements to 5 minutes. Their entire statement will, of course, appear in the hearing record.

And, again, gentlemen, when you begin, you will see the lights that are displayed. As you get closer to the end of your testimony, you will see a yellow light. And when your time is about to run out, you will see a red light. I will encourage you to wrap up at that point.

We will allow the entire panel to testify before questions begin.

The Chair now recognizes Dr. Scott Kraus for 5 minutes. Welcome, Doctor.

STATEMENT OF DR. SCOTT KRAUS, VICE PRESIDENT AND SENIOR SCIENCE ADVISOR, CHIEF SCIENTIST, MARINE MAMMAL CONSERVATION, ANDERSON CABOT CENTER FOR OCEAN LIFE AT THE NEW ENGLAND AQUARIUM, BOSTON, MASSACHUSETTS

Dr. KRAUS. Thank you, Chairman Huffman and Ranking Member McClintock, for inviting me to testify on the status of the North Atlantic right whale. I have spent almost 40 years studying this species, publishing over 80 scientific papers on its biology, ecology, and conservation.

In addition, my research team curates the North Atlantic right whale catalog, a photographic record of every individual right whale in the population. I am here to speak to the threats to this species and the need for enhanced Federal and state efforts to prevent North Atlantic right whales from going extinct.

This species is among the most endangered whale on the planet, with only about 400 left. Despite almost 50 years of Federal management efforts, the stock is now declining rapidly. Why does this matter?

Whales are incidental farmers of the sea. They fertilize the entire marine food chain, supporting ocean ecosystems and commercial fisheries. Whales are also the basis of a large tourist economy on both coasts, worth hundreds of millions of dollars annually.

North Atlantic right whales feed in waters off New England and Canada during the spring, summer, and fall, and pregnant females migrate to calving grounds off the southeast U.S. coast to give birth during the winter. This distribution and their migration patterns expose them constantly to threats from human activities, including entanglements in fishing gear, collisions with ships, and disturbance from underwater noise.

Right whale deaths from ship strikes and fishery entanglements slow or halt population growth. Our research indicates that twice as many whales die annually than are documented or estimated. In 2017 and 2018, 20 right whales were found dead, representing nearly 5 percent of the population. Of the 12 whales that were examined carefully, all had died from human causes.

On the other side of the equation, for right whales to grow in population size, they need to have babies. That means we must reduce the exposure of all whales, but particularly females, to stressors that can slow or stop reproduction. This includes underwater noise, pollutants, and sublethal fishery entanglements. Climate change also likely affects whale health and reproduction.

Chronic underwater noise is a proven stressor to right whales. Chronic stressors are known to cause increased disease and mortality and lower reproduction rates in a variety of mammals, including humans. Right whales are already exposed to relentless shipping, dredging, pile driving, and other industrial noises, which are likely impairing their ability to communicate, to find food, and to find mates.

In November 2018, NOAA's National Marine Fisheries Service issued five Incidental Harassment Authorizations allowing companies to take marine mammals during geophysical surveys off the southeastern United States, which is the only known right whale calving ground. This activity will create a chronic disturbance and raise background noise levels throughout the right whales' habitat, increasing the risk of mother-calf separations.

NMFS' assertion that the effects of seismic surveys will be transient is not believably defensible. Air gun noise is constant, with explosions every 10 to 16 seconds. Combined, these authorizations represent about 850 ship-days of 24-hour explosions within a single year.

Finally, NMFS' plan to close, seasonally, some areas to seismic surveys out to 90 kilometers from shore ignores the recent changes in right whale distribution and the fact that air gun noise travels many hundreds of kilometers underwater.

The recent population decline is partly due to deaths from entanglements in fishing gear and collisions with ships. It has been made worse by low calf numbers. None were born in 2018, and only seven have been born this year. Right whale survival is entirely dependent upon reducing human-caused mortality and eliminating stressors that impact reproduction. Without dedicated efforts to reduce the effects of human activities, this species is likely to go functionally extinct in about 20 years.

Despite all this, the North Atlantic right whale is not doomed to extinction. They will adapt to changing conditions, find food in new places, and start having calves again. In the meantime, we need to stop killing them and disrupting their lives.

In my expert opinion, NOAA's authorization of the seismic exploration near the right whale calving ground is a step backward. In contrast, NOAA's existing ship speed limit rule has definitely reduced ship kills. And I am also pleased that NOAA is enhancing efforts to reduce entanglements of right whales in fishing gear.

Minimizing the human causes of right whale deaths and reducing stresses that impact right whale health and reproduction will help this species move toward population recovery.

[The prepared statement of Dr. Kraus follows:]

PREPARED STATEMENT OF DR. SCOTT KRAUS, VICE PRESIDENT AND SENIOR SCIENCE ADVISOR, ANDERSON CABOT CENTER FOR OCEAN LIFE, NEW ENGLAND AQUARIUM

Thanks to Chairman Huffman and Ranking Member McClintock for inviting me to testify on the critically important topic of the plight of the North Atlantic right whale, among the most endangered baleen whales in the world. I am Vice President and Senior Science Advisor in the Anderson Cabot Center for Ocean Life at the New England Aquarium. The New England Aquarium is a catalyst for global change through public engagement, commitment to marine animal conservation, leadership in education, innovative scientific research, and effective advocacy for vital and vibrant oceans. The Center's mission is to conduct research on topics related to ocean health and conservation and to develop science-based solutions to marine conservation problems. Before assuming my present role, I served for 22 years as the Aquarium's Vice President and Director of Research. I am Research Faculty at the University of Massachusetts, Boston and am a member of the Marine Technology Society, the Marine Mammal Society, and the American Association for the Advancement of Science. I have spent almost 40 years studying the North Atlantic right whale (*Eubalaena glacialis*), publishing more than 80 scientific papers on its distribution, ecology, and conservation. My research team curates the North Atlantic Right Whale Catalog, a photographic index of nearly every individual right whale in the population that is the cornerstone of work in the field. I am a Board Member and vice-Chair of the North Atlantic Right Whale Consortium, a multi-sector collaborative research and conservation effort with partners from government, industry, research institutions, and conservation organizations. I am also a member of the Atlantic Large Whale Take Reduction Team that the National Marine Fisheries Service (NMFS) has convened since 1996 to reduce entanglements of right whales and other large whales in fishing gear.

I am here to testify in support of Federal and state efforts to reduce the threats to the North Atlantic right whale. This is among the most endangered whales on the planet, with only about 400 individuals surviving. Despite almost 50 years of Federal management efforts, the stock is now declining rapidly. Why should we care? Protecting right whales protects entire ocean ecosystems, including other whales, sea turtles, commercial fish species, even plankton. Generally, whales are the basis of a large tourist economy on both coasts worth hundreds of millions of dollars annually. Whales act as incidental farmers of the sea, capturing food at depth and releasing nutrients at the surface, thereby fertilizing and supporting the entire marine food chain (Roman et al. 2014). This fertilizing function moderates climate change (Pershing et al. 2010) and supports the marine productivity that robust and economically valuable fisheries depend upon (Lavery et al. 2014; Roman et al. 2016). Because whales are mammals like us, they serve as an early warning for drastic ecosystem changes in the oceans that will damage fisheries and coastal human communities. Finally, whales are more like us than most people realize—they have culture, dialects, individual voices, family trees, and long-term social structures (Whitehead and Rendell 2014). For all of these characteristics, we owe them more than treating them as collateral damage in the industrialization of the oceans.

The North Atlantic right whale's life cycle takes it through some of the most industrialized, commercially active regions of the North Atlantic (Kraus and Rolland 2007). These iconic whales forage largely in waters off New England and the Canadian Maritime provinces during the spring, summer, and fall, and pregnant females then migrate to calving grounds off the southeast U.S. coast during the winter. That distribution has exposed them to a suite of anthropogenic stressors, including entanglements in fishing gear, collisions with ships, disturbance and masking from underwater noise, and pollutants. As described further below, these stressors have affected the whales' birth and death rates and have impeded their recovery

from whaling. Without concerted efforts to reduce the effects of human activities, this species is likely to go functionally extinct in about 20 years.

The North Atlantic right whale is a large baleen whale that can reach 50 feet in length and weigh as much as 100,000 pounds. They spend the warmer months feeding on tiny zooplankton called copepods in the coastal and offshore waters of eastern North America. In the late fall, pregnant females head south to waters off the Carolinas, Georgia, and northern Florida to give birth in the winter, returning north with their calves in the spring. Like all large whales, the right whale was once hunted for its oil. The species obtained its name from early Yankee whalers as the "right" whale to kill, because of its high yields of oil and baleen, its comparatively slow speed, and its tendency to float for some time after death, enabling easy retrieval. By the early 1700s, the North Atlantic population had been hunted nearly to extinction. However, whalers seeking other species in the Atlantic still hunted and killed any right whales encountered, right through the early 1900s. The League of Nations barred further killing in 1935, a protection that was extended after World War II by the International Whaling Commission. It is listed as endangered under the U.S. Endangered Species Act and is protected under the Marine Mammal Protection Act. According to the most reliable population estimate, an estimated 411 were alive at the end of 2017 (Pace et al. 2017; Pettis et al. 2018). Based upon the known 2018 right whale deaths, the estimated actual deaths, and the lack of calving, it is likely that the population at the end of 2018 was just under 400 animals. A total of seven calves have been born to date in 2019.

Right whales experienced some population growth during the 2000s. During that decade, they produced an average of about 24 calves each year and experienced around 3 known deaths each year from entanglements with fishing gear and ship kills (Waring et al. 2006, 2011), resulting in an annual increase of about 2.8 percent in population abundance. This growth rate was significantly smaller than the annual growth observed in many baleen whale populations that have recovered from whaling, including that of the Southern right whale, a related species that lives in the waters of the Southern Hemisphere (Corkeron et al. 2018). This period of slow but positive growth for the North Atlantic right whale lasted until 2010, when the species entered a state of decline. Right whales have now been declining every year for the past 8 years (Pace et al. 2017). The decline is marked by increasing numbers of deaths, reduced calving rates, and poor health condition. All scientific evidence indicates that this decline can be attributed entirely to human activities. This type of rapid decline in the population has not been seen since the period of active right whaling prior to 1750 (Reeves et al. 2007).

INCREASES IN DEATHS

During the 5-year period from 2010–2014, human activities killed or seriously injured right whales at more than twice the rate observed during the previous decade, with known mortalities rising from an average of 2.6 to 5.7 incidents per year. The legal threshold required to trigger management action for this species under the Marine Mammal Protection Act, called the "potential biological removal level," is less than one serious injury or mortality per year (Waring et al. 2006, 2011, 2016). The term "potential biological removal level," or "PBR," means "the maximum number of animals, not including natural mortalities, which may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population." For the last 20 years, the annual PBR established by the NMFS for right whales has been between 0 and 1, and that number has been exceeded every year.

In 2017 and 2018, researchers documented the deaths of 20 right whales, nearly 5 percent of the population. Twelve were subjected to complete or partial necropsies, and the deaths of all the examined whales were due to human causes.

The *actual* number of right whale mortalities is likely far greater than the unprecedented amount of documented deaths. Since 1980, the right whale research team at the New England Aquarium has curated a photographic catalog of individuals in the North Atlantic right whale population (Hamilton et al. 2007; http://rwcatalog.neaq.org). From nearly 40 years of photographic records, it is known that only one-third of right whales are detected when they die; the rest simply disappear from the photographic sightings record. Based on our limited ability to detect mortalities, the 20 right whale deaths reported during the last 2 years represent fewer than half of the actual losses during that time period.

As a consequence of human-caused mortality, right whale longevity, which can exceed 70 years (Hamilton et al. 1998), has dropped to a mere 30 to 40 years. It is unlikely that right whales die of old age anymore.

CALVING DECLINES

As mortalities in the population have increased, calving rates have fallen. During the 1980s and 1990s, North Atlantic right whale females had calves every 3 to 5 years. In the 2000s, however, most females began producing calves at longer intervals, which are now approaching 10 years (Pettis et al. 2018). As a consequence, calf numbers over the 2010–2018 period decreased by 43 percent as compared to the previous decade. No calves were born in 2018, and seven were born in 2019 to date.

It is unlikely that the research community has failed to detect significant calving activity in undiscovered locations beyond the southeastern U.S. continental shelf. As curators of the North Atlantic Right Whale Catalog, my research team at the New England Aquarium collects photographic data on right whales from hundreds of sources, including several other major research institutions along the East Coast of the United States, Canada, and Iceland, fishermen, recreational boaters, the U.S. Coast Guard, and many others. Aerial surveys for this species are regularly flown off Massachusetts, Rhode Island, New York, Maryland, Virginia, North Carolina, South Carolina, and in the whales' calving grounds off Georgia and northern Florida.

Breeding females make up an unusually small percentage of the right whale population, and as of 2015, only an estimated 105 were alive (Pace et al. 2017). Female right whales may be especially vulnerable to human impacts because their migration to the calving ground (which males rarely make) takes them through the heavily used coastal waters of the eastern United States (Caswell et al. 1999; Fujiwara and Caswell 2001). Females attain sexual maturity around 10 years of age, and human activities are now killing them before the age of 40, leaving relatively few years for reproduction. Further, female body condition is dependent upon high-quality habitat that includes a combination of adequate food, quiet conditions for communication, and low levels of extrinsic interactions with human activities. Good body condition is defined as good health and blubber (fat) reserves, which female whales require for ovulation, pregnancy, and especially lactation. Chronic stressors can reduce physiological resilience and lower body condition over time to the point where it falls below the necessary threshold for pregnancy. Health assessments show that many female right whales are in poor body condition, falling below the health indicators consistent with successful calving (Rolland et al. 2016; Pettis et al. 2017).

CUMULATIVE IMPACTS AND CHRONIC STRESSORS

The right whale is subject to a cumulative impacts problem as its survival is threatened by multiple anthropogenic stressors including fishing gear entanglements, ship strikes, underwater industrial noise, habitat use and climate change, and now also the threat of seismic exploration.

Fishing Gear Entanglements: Right whales are increasingly subject to entanglement in fishing gear, particularly in the ropes used by lobster and crab fishermen to deploy, mark, and retrieve their traps at sea. From 2010–2014, entanglements caused more than four times as many right whale deaths and injuries likely to result in death, than during the previous 5 years (Kenney 2018; Waring et al. 2011, 2016). Additionally, the health consequences of an entanglement can last long after the whale is freed. Right whales can have poor body condition and are significantly less likely to reproduce for at least 1 year following serious entanglement (van der Hoop et al. 2017). This problem is widespread. At least 83 percent of all North Atlantic right whales have scars from being entangled at least once in their lives, and 59 percent have been entangled more than once (Knowlton et al. 2012).

Ship Strikes: Right whales are also killed by collisions with ships, as their habitat coincides with a number of major shipping routes. Overall, mortalities from ship strikes have decreased over the past 15 years (van der Hoop et al. 2015), likely due to several successful conservation efforts that included routing changes in the Bay of Fundy, Roseway Basin, and Boston shipping lanes that were permanently established between 2003 and 2009, and the U.S. adoption, in 2008, of a speed regulation for commercial ships along the U.S. East Coast. Nonetheless, vessel collisions continue to account for right whale deaths including, in 2017, one lethal strike reported off Massachusetts and four in the Gulf of St. Lawrence.

Habitat Use and Climate Change: Recent changes in right whale health and habitat changes have been associated with climate change, through changes in oceanographic conditions and in the distribution and abundance of their prey species (Record et al. in press). Since 2010, right whales have been distributed less predictably, including year-round occurrences in southeastern United States and mid-Atlantic coastal waters, aggregations in the winter and spring south of Cape Cod

(Leiter et al, 2018), and sightings and recordings of right whales on the continental shelf edge during the summer months (June and July) and as far south as Georgia (Hodge et al. 2015; Salisbury et al. 2015). Acoustic detections off the southeastern United States have documented small numbers of right whales in the area from August through October (Davis et al. 2017). Right whale sightings have occurred in Bermuda, the Azores, and the Canaries, indicating that the species occasionally travels into deep, warm waters well beyond the continental shelf. Further, pregnant right whales may give birth south of Cape Hatteras while on southward migration, or go offshore to give birth before returning to coastal habitat in the southeast (Zani et al. in prep). The historical thinking about seasonal movements of right whales no longer applies, as new aggregation areas are being identified and "traditional" ones are being used differently.

Underwater Industrial Noise: Underwater noise constitutes another serious, demonstrated stressor on the population (see section on Seismic Exploration below). Due to shipping noise, right whales have lost much of their ability to communicate over long distances (Hatch et al. 2012). Additionally, the broadband noise produced by shipping traffic has been shown to induce chronic physiological stress in right whales (Rolland et al. 2012). That result is consistent with data on the effects of noise on numerous other species (Romero and Butler 2007). Chronic stress increases vulnerability to disease and causes increased mortality and compromised reproduction across a wide variety of mammals. Right whales are exposed to widespread shipping, dredging, pile-driving and other industrial noises, which are impairing communication, food finding, and reproduction (Hatch et al., 2012).

Seismic Exploration: In November 2018, NMFS issued five separate incidental harassment authorizations (IHAs) to incidentally harass marine mammals during geophysical survey activities in the Atlantic Ocean. The authorized seismic surveys will involve multiple vessels operating simultaneously, each for periods of months, producing chronic noise that will propagate hundreds of kilometers and raise ambient noise levels throughout right whale habitat. Since shipping noise demonstrably increases the stress response in right whales (Rolland et al. 2012), it is likely that constant exposure to seismic airgun noise, which is much louder than ship noise, will increase chronic stress in this species. Chronic stress in all mammals (including humans) reduces immune and endocrine function, negatively affecting reproduction and disease resistance (Romero and Butler 2007). This is an impact that this critically endangered species cannot tolerate. Many adult female right whales now have health scores that are just above the threshold of reproductive success (Rolland et al. 2016), suggesting that any additional stressors that reduce body condition will push them below any ability to reproduce. Low health scores are also associated with lower probabilities of survival. The authorized seismic surveys would reduce fitness in these already health-compromised animals, reducing survival and reproduction and pushing the population increasingly toward extinction.

NMFS Biological Opinion on Seismic Impacts to Right Whales was Flawed:

Before issuing the IHAs, NMFS developed both a Biological Opinion and an IHA notice that included an impact analysis. This analysis was inadequate and contained significant flaws in both fact and interpretation as follows.

(1) NMFS bases its impact analysis on a cetacean abundance model by Roberts et al. (2017). This model maps the distribution and density of whale, dolphin, and porpoise populations along the U.S. East Coast and in the northern Gulf of Mexico. While the model represents an advance over earlier efforts for many species, it does not incorporate much of the recent data on right whale occurrence that demonstrates their extended use of habitats in the mid-Atlantic and Southeast. Because of the distance sampling constraints of the data selection, the model does not take account of numerous opportunistic sightings and systematic acoustic detections in the mid-Atlantic and Southeast regions. Moreover, very little systematic distance sampling survey effort has occurred beyond the whales' designated critical habitat, an area covering only a small portion of the continental shelf. As a result, the model is likely to underestimate right whale distribution beyond surveyed areas within 40 miles from shore.

(2) Any credible environmental analysis must consider the cumulative acoustic impacts of the five authorized seismic surveys in the context of the right whale's current conservation status and all factors impacting the population. The addition of seismic exploration as another significant stressor on the most vulnerable segment of the population, reproductive females and their calves, was considered in isolation from all other stressors listed above.

(3) Seismic exploration is likely to increase ambient noise levels across the entire continental shelf, which may interfere with mother and calf communication, increasing risk for calf survival. In calving grounds off the southeastern United States and in the migratory corridor, seismic noise would increase the probability that right whale mothers and calves could get separated by disrupting their ability to hear one another. Recent studies show that mother-calf pairs communicate with very low-amplitude calls (Parks et al. 2018; Cusano, et al. 2018), which will be vulnerable to interference or masking from small increases in ambient noise (Clark et al. 2009). Even short-term separation is a risk for calves, primarily from shark predation (Taylor et al. 2012).

(4) Seismic noise could displace right whale mothers from their primary calving grounds, leading them to give birth in sub-optimal habitat where newborn survival is compromised. It is likely that the combination of bathymetry and temperature in the coastal waters of the southeastern United States are critical to right whale calving. While NMFS asserts, in its notice supporting the present authorizations, that marine mammals displaced by seismic exploration may "seek temporary viable habitat elsewhere," habitat suitable for right whale calving is limited. Given the hundreds of kilometer range of seismic noise propagation, it is certain that the authorized surveys, which combined represent about 850 ship days of active airgun use in a single year, would compromise large areas of right whale habitat for calving and other purposes.

(5) NMFS' assertion that the behavioral effects of the authorized surveys will be "transient" is not biologically defensible. There is strong evidence that seismic airgun noise directly alters the behavior of baleen whales, including vocalization behavior associated with migration, feeding, and other functions, at low received sound pressure levels and at distances of tens to hundreds of kilometers from the airgun source (e.g., Blackwell et al. 2015; Castellote et al. 2012). Additionally, seismic airguns can mask baleen whale vocalizations, reducing the whales' communication space and compromising their behavior, at scales of hundreds to thousands of kilometers (e.g., Estabrook et al. 2016; Nieukirk et al. 2012). Given the amount of seismic airgun activity that NMFS has authorized and its range of influence, important right whale behavioral patterns will be disrupted frequently and repeatedly.

(6) NMFS has prescribed a seasonal closure of coastal waters out to 90 kilometers. This ignores recent changes in distribution as right whales are now occurring further offshore, beyond NMFS' closure area and outside the putative migratory season during times of year when the closure does not apply (Davis et al. 2017) (see Habitat Use and Climate Change section above). This also ignores the way airgun noise spreads for hundreds of kilometers, making the 90 kilometer exclusion zone biologically meaningless.

RIGHT WHALE STATUS AND MANAGEMENT OPTIONS FOR RECOVERY

In conclusion, the North Atlantic right whale is among the most endangered whales on the planet, with about 400 individuals remaining, including about 100 breeding females. Despite almost 50 years of Federal management efforts, the stock is now declining rapidly. This decline is linked largely to mortality from entanglements in fishing gear and from vessel collisions. It is exacerbated by low calving rates, which are probably due to the sublethal effects of by entanglements, underwater noise, and food availability. These combined effects are likely to reduce body condition and health in all exposed right whales and will have negative effects on reproduction and survival. The efforts currently underway to reduce accidental killing of right whales by ships and fishing gear must be matched with appropriate protections for reproductive females and their calves off the mid-Atlantic and southeastern United States.

The recent decline in calving rates does not mean that the right whale population is doomed to extinction. Mammalian females of all species slow or stop reproduction when environmental conditions are poor and wait to have offspring when conditions improve. This species can adapt to changing conditions, will find food sources in new places, and start having calves again at rates that can maintain and grow the population. However, North Atlantic right whales do not have the capacity to sustain high death rates for long. For this species to recover, it is critical for managers to prevent human-caused mortality and eliminate those stressors in their ocean habitats that reduce individual whale health. For all of these reasons, the New England Aquarium is opposed to NOAA's issuance of the five IHAs for seismic exploration. However, we support NOAA's existing ship speed rule, and recommend that NOAA urgently enhance its efforts to reduce the entanglements of right whales in fixed fishing gear. We also support NOAA's work on reducing shipping noise and other noise in the ocean, as well as the many Federal and state efforts to reduce pollution

of all kinds in the sea. Reducing the human causes of right whale deaths, and reducing sub-lethal stressors that reduce whale health, will allow this species time to adapt to its new environmental conditions and begin the road to population recovery.

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QUESTIONS SUBMITTED FOR THE RECORD TO DR. SCOTT KRAUS, VICE PRESIDENT AND SENIOR SCIENCE ADVISOR, ANDERSON CABOT CENTER FOR OCEAN LIFE, NEW ENGLAND AQUARIUM

Question Submitted by Rep. Lowenthal

Question 1. Dr. Kraus, both offshore drilling and wind farm development require seismic surveys. Are the impacts on North Atlantic right whales the same for both forms of development? Do we have a reason to be more concerned about the seismic surveys required for offshore gas and oil development?

Answer. There are two fundamental differences between the seismic methods used for oil and gas, and those used for assessing pile driving options for wind farms. One, airgun arrays used for oil and gas exploration produce sound with source levels typically between 240 and 260 db. Wind farm companies only need to know what is beneath the ocean floor down to a depth of perhaps 50 meters, so their systems use much less power, typically with source levels of 210–220 db at 1 m. This means the spread of the sound is orders of magnitude less than seismic for oil and gas. Second, wind farm companies generally lease small areas of sea floor, so a geotechnical survey of their area of interest is much more limited in scale and time than the broadscale surveys for oil and gas. Put another way, these surveys are relatively short term in duration (a couple of months at most), and their acoustic impact will be on the order of kilometers, as opposed to hundreds of kilometers for oil and gas exploration seismic sounds.

Mr. HUFFMAN. Thank you, Dr. Kraus.

Next is Dr. Burnett.

STATEMENT OF DR. H. STERLING BURNETT, SENIOR FELLOW AND MANAGING EDITOR, ENVIRONMENT & CLIMATE NEWS, THE HEARTLAND INSTITUTE, ROWLETT, TEXAS

Dr. BURNETT. Thank you, Chairman Huffman, Ranking Member McClintock, and the other distinguished members of the Committee for inviting me to speak today.

I want to say at the outset, we all recognize that energy is a fundamental building block of modern society. And fossil fuels, it is just a fact, now and for the foreseeable future, will provide the lion's share of that energy. The question is, where will we get that energy from going forward? And at what cost?

My background—I am not a scientist. I am not an expert in right whales. I am a philosopher. I do philosophy of science. Environmental ethics, my training, is to follow the argument where it goes. But my training in applied philosophy says that your values, your choices you make, should be informed by facts, by data.

Good science, good laws, good public policy, all depend on good data. And good data is precisely what we lack concerning how much oil and gas exists off the Atlantic Coast, where it is located, in what volumes and what formations. It has been 40 years.

And while it is certainly true that many governors on the East Coast object to oil and gas drilling, they are making decisions for them and future governors in ignorance. They are making these decisions with their eyes blinded because we don't have the data. They cannot make an informed decision because we don't know how much is there, so how much they would be forgoing.

It may be the case that good data will show the Atlantic outer continental shelf contains so little, or so widely dispersed—not captured in large, appreciable volumes—that it would support their decisions and it would make it easy because oil companies just will not want to go out there. And at current prices, they probably don't want to go out there.

Alternatively, an updated, accurate assessment with the newest technology could show vast volumes and may change their or future governors' minds, especially when the next recession comes, and we know recessions will come, and their budgets are strained, and they are figuring out a way to pay for their education, pay for their roads, pay for other things. But regardless, they should make these decisions not on outdated data, not on poor science, but on the best available science. And that requires new testing, comprehensive testing.

Threats to whales consist of, well, nature, in part. They start from a low population size, even a lower fertile breeding population of females. They are slow to reproduce. And then they face all the human threats. The dominant ones—and I will not go into it but we all know from testimony earlier today—the dominant ones are vessel strikes and entanglement. I don't know it is the case, but I wonder if pollution, plastics pollution in the ocean, might also be contributing to that. If so, tourism then is contributing to whale struggles.

I keep hearing the concern about offshore seismic testing. But I do not hear the same concern concerning offshore seismic testing for wind turbines, hundreds of which will have to be located precisely—not a few dispersed over large areas of the ocean, but hundreds of which in concentrated areas of the ocean right along the migration routes—with the same seismic testing.

I don't know if the SAVE Right Whales Act—I have not had a chance to review it—deals with just seismic testing for oil and gas, or if it deals with all seismic testing. But if it doesn't deal with all seismic testing, then it is dishonest. It is just against oil and gas. It is not about the right whales; it is about oil and gas because protecting the right whales would demand the same thing for wind farms.

I note that just a month ago, you had a woman from the Massachusetts Lobstermen's Association testify, and she spent three paragraphs in her testimony talking about the threats from wind farms to the fishing industry and a paragraph concerning right whales. She spent one paragraph concerning oil spills for the oil industry. So, she certainly sees it as a bigger threat. But no one seems to be addressing that, or care.

I will stop there.

[The prepared statement of Dr. Burnett follows:]

PREPARED STATEMENT OF H. STERLING BURNETT, PH.D. SENIOR FELLOW, THE HEARTLAND INSTITUTE

Chairman Huffman, Ranking Member McClintock, and other members of the Subcommittee: Thank you for the opportunity to testify concerning the need to accurately assess the potential oil and gas deposits beneath the U.S. Atlantic Outer Continental Shelf (OCS) and the purported threat a comprehensive survey of the region might pose to the North Atlantic Right whale (hereafter called "right whale").

My name is Harold Sterling Burnett. I am a senior fellow with The Heartland Institute, where I also serve as managing editor of *Environment & Climate News*. I won't bore you with my entire vitae, which you have already received, other than to say I have a Ph.D. in applied philosophy, with a specialization in environmental ethics, from Bowling Green State University.

I have been conducting energy and environmental policy work at various think tanks, as well as in the field, part-time since 1987 and full-time since 1996. The views I express in this testimony are my own and should not be construed as necessarily representing any official position of The Heartland Institute.

Energy is the fundamental building block of modern society. Fossil fuels service the lion's share of the world's energy needs, including in the United States. Numerous reports by the International Energy Agency and Energy Information Administration confirm fossil fuels will continue to make up more than 80 percent of the world's primary energy base in 2050.

With this in mind, the most important questions are: Where will the United States get its share of that energy, and at what cost?

President Donald Trump has provided his answer to the former question as part of his America First Energy Plan. The Trump administration aims to pursue energy dominance by encouraging the development of all forms of domestic energy production and to minimize the United States' dependence on foreign sources of critical energy supplies.

As part of that effort, President Trump revised a 5-year energy and gas leasing program imposed under the Obama administration that barred oil and gas development in most, if not all, of the Atlantic OCS. Toward the end of the Obama administration, it also denied permits for seismic surveying in the Atlantic area.

The Trump administration has proposed replacing the Obama administration's 2017–22 plan with a modified 2019–24 plan, including a reversal of the decision to prevent seismic surveying.

While I applaud President Trump's commitment to putting America and its energy needs first, it should be recognized that a survey of the Atlantic OCS is not necessarily a prelude to wholescale oil and gas production, but rather an information-gathering exercise.

Good data and facts are critical to the development of good decision making, science, and public policy. I often hear lawmakers claim when advocating for a new policy proposal, "We should follow the science." But science doesn't fall like received wisdom from Heaven; it requires extensive research and effort.

Before America's political and private sector leaders can make informed decisions concerning the relative benefits and costs of oil and gas exploration or production, the government, taxpayers, and oil and gas companies must have a better understanding of how much oil and gas might be available and what it would cost to develop it.

We currently lack reliable data for the Atlantic OCS. It's been more than 40 years since the most recent comprehensive Atlantic Coast geological seismic survey was conducted, and seismic survey technology has improved considerably since then. It has become more effective and less invasive. Because it has been so long since a survey has been completed, we have a limited, outdated understanding of the natural gas and oil resources located off the U.S. Atlantic seaboard. An updated OCS survey is long overdue.

Extensive data might, once fully gathered, show the Atlantic OCS contains so little or so widely dispersed potential oil and gas that oil companies would not find it worthwhile to explore the region. Perhaps it would lead policy makers to conclude the potential benefits are outweighed by the risks.

Alternatively, an updated seismic survey might discover the potential for billions of barrels of recoverable oil and trillions of cubic feet of natural gas. In that were to occur, the Trump administration, governors of potentially affected states, and Federal and state legislators would be able to accurately consider, with open eyes, the potential benefits and costs of exploration.

Some have expressed concern seismic surveying would result in serious ecological damage, including harm to whales and other marine life. However, the National Marine Fisheries Service (NMFS), the agency charged with, among other things, protecting marine species, has concluded seismic surveying poses no significant threat to marine life. In 2014, under the Obama administration, NMFS stated, "To date, there is no evidence that serious injury, death, or stranding by marine mammals can occur from exposure to airgun pulses, even in the case of large airgun arrays."

A 2014 report from the chief environmental officer of the Department of the Interior's Bureau of Ocean Energy Management came to the same conclusion, stating: "To date, there has been no documented scientific evidence of noise from

airguns used in geological and geophysical seismic activities adversely affecting marine animal populations or coastal communities."

More recently, in 2017, the Lamont-Doherty Earth Observatory (associated with Columbia University) conducted a seismic survey off the coast of North Carolina to map plate tectonics, using the same type of ships and equipment oil and gas mapping would require. This seismic survey went forward without any objections that I am aware of, even though it covered a larger area than testing for oil and gas off the coast of North Carolina would. Research indicates a fossil fuel survey would cover just 10–50 miles, compared to 2–200 miles for the Lamont-Doherty survey. Further, the Lamont-Doherty seismic survey sent out much stronger signals that traveled deeper into the ocean bed.

Despite the larger scale of the Lamont-Doherty survey, a study by the National Science Foundation concluded the survey caused no consequential harm to the ocean's wildlife or the ecosystem.

It's also worth noting many of the same people and groups objecting to an oil-and-gas-related seismic survey because it would harm the right whale have not expressed similar objections to the seismic surveys that would have to be conducted to erect the huge, much more extensive and interconnected offshore wind farms proposed for placement in right whale migration routes and breeding grounds.

An exception to my previous statement was included in testimony to this very Committee on February 7, when Beth Casoni, executive director of the Massachusetts Lobstermen's Association, provided a single-paragraph warning of the potential harms posed by offshore oil and gas development to fisheries and whales. She devoted three paragraphs to providing warnings of the dangers to the fishing industry and right whales from offshore wind turbines. If seismic surveys are dangerous to North Atlantic right whales, why should renewable energy companies be permitted to site offshore wind turbines?

There are anthropogenic threats to the right whale, but offshore oil and gas production and seismic testing are not foremost among them. Shipping vessel strikes account for the largest percentage of human-caused right whale mortality. Entanglement in floating fishing lines also accounts for many injuries and deaths. One study estimated approximately 85 percent of right whales have entanglement scars. Further, a Canadian estimates shipping strikes and entanglement have accounted for nearly 50 percent of all known right whale deaths since 1970. Plastics in the ocean are another potential source of harm.

Interestingly, the development of oil and gas for use as fuel might actually have contributed to *saving* the right whale and a few other whale species from extinction. History shows the greatest threat to whale survival ever recorded was the whaling conducted by humans to render blubber down to whale oil for use in lamps and for other uses. The right whale got its name because it was the "right" whale to kill for its blubber, which could be rendered into whale oil and other products. The advent of the fossil fuel industry saved whales from extinction, because the world quickly replaced whale oil with kerosene and other petroleum products.

One final objection I wish to address is that some say because the world is awash with oil and gas and prices are so low, we don't need to survey or explore new offshore areas. It's true that it takes years from the time offshore surveys are conducted to when leases are offered, areas are explored, and production takes place. As much as a decade can pass from survey to production.

In the past, I've debated people who said during periods of high prices, we don't need to explore for new offshore oil and gas regions because it would take 10 years to develop, and by then, the crisis will pass. To that, I say, "Let's get ahead of the curve and prepare for the next shortage." One thing we can be fairly certain of is oil and gas supplies won't always be so abundant and prices so low. The best hedge against future high prices is to know where to go to exploit future oil and gas reserves, as well as how much exists.

Historically, physical and political restrictions have limited supplies of these two critical resources, causing price spikes that rippled throughout the U.S. economy, harming businesses and consumers. By conducting a comprehensive survey now, industry can hit the ground running to produce new supplies when limited supplies and high prices make such development economically worthwhile, and when the same factors incentivize political leaders to support production.

Further, and this is just speculation, the fracking revolution that so many of the same people who object to offshore oil and gas exploration decry might partly have resulted from the absence of an up-to-date survey of OCS reserves and restrictions on OCS production outside the Gulf of Mexico.

Fracking is largely responsible for the economic recovery that began late in the Obama administration, as the oil and gas industry was responsible for an outsized proportion of the growth in employment. Lower energy prices, provided in large part

by fracking, have also helped mom and pop businesses and large companies alike to compete with global competitors, and they have helped to bring back the chemical production and refining industry to America's shores.

Modern fracking required the development of technological innovations and new techniques that might not have been sought or developed had offshore oil and gas mapping, exploration, and production been shuttered outside the Gulf of Mexico. If permitted, industry might have used existing deep-water drilling technologies to develop OCS oil and gas reserves, rather than seeking new techniques to exploit additional reserves on land.

In closing, thank you all once again for the opportunity to testify concerning this important issue. I look forward to any questions you might have regarding my testimony.

Mr. HUFFMAN. I thank the gentleman.

Dr. Clark, you are recognized for 5 minutes.

STATEMENT OF DR. CHRIS CLARK, SENIOR SCIENTIST, RESEARCH PROFESSOR, CORNELL UNIVERSITY, ITHACA, NEW YORK

Dr. CLARK. I thank Chairman Huffman and Ranking Member McClintock for inviting me to testify on behalf of North Atlantic right whales and the potential impacts of noise from seismic air gun surveys on this highly endangered population.

Like Scott and Dr. Kraus, I have been studying right whales a long time, since 1973. And scientific studies over these last four to five decades have confirmed that baleen whales, including North Atlantic right whales, produce an extraordinary variety of sounds which they use for all types of critical life functions, such as communicating, navigating, mating, and maintaining social bonds such as those between mothers and calves.

There is also compelling evidence that baleen whales, including North Atlantic right whales, have excellent low-frequency hearing. The low-frequency, extremely loud explosions produced by seismic air guns fall right on top of that frequency range in which right whales produce these sounds.

Right whales are highly dependent on contact calls, a means of maintaining social contact and coming together in social groups. Mothers and calves use very soft calls to maintain close proximity in order for the calf to nurse and increase the chances of a mother protecting her calf from killer whales and sharks.

These interactions are dependent on listening for and recognizing sounds under naturally quiet conditions. Research has shown that right whales produce contact calls and counter-calls in every location along the East Coast where we have listened. Calling whales are detected throughout the year in regions and at times of year when they were not expected to occur—in some cases, as far out as the continental shelf break. That is 90 to 150 kilometers offshore.

Why am I so absolutely certain that the noise from the seismic air gun arrays will jeopardize and increase the risk of harm to North Atlantic right whales? Noise from seismic air gun explorations has been detected throughout the North Atlantic, and are essentially everywhere. We have heard air guns even when the seismic surveys were conducted far, far away from the recorders.

I am talking about recording them on the eastern U.S. coast to systematic explosions off Canada, 1,200 kilometers away; French Guiana, 3,800 kilometers away; and Western Ireland, 5,000 kilometers away. Explosions off Virginia will propagate into the waters off New Jersey, New York, Rhode Island, and elsewhere.

Because these surveys occur in distant places and influence the ocean's acoustic environment over such enormous areas—these are areas of many hundreds of thousands of kilometers squared—and temporal scales—years on end—assessing the full scale of this chronic impact is challenging. But I am convinced that the most critical impacts are chronic, not acute.

My deep concern about seismic impacts on right whales comes from responses of bowhead whales, a close relative, to seismic surveys. Susannah Blackwell and her colleagues have shown that bowhead whale calling rates increase as soon as air gun pulses were detected, then plateaued as increased received levels occurred, began decreasing as received levels continued to rise, and then ceased entirely at higher levels. In other words, the whales initially adapt to the noise, and then eventually just give up.

In my opinion, this significant and consistent response by an endangered species to seismic air gun arrays is alarming given that none of the proposed monitoring or mitigation actions proposed for North Atlantic right whales can determine whether or not right whales modify their calling behavior from the proposed seismic activities, and the inability to observe a response is not evidence of no response.

Right whales as well as many marine animals are dependent upon a natural quiet ocean for basic life functions. Seismic air gun arrays off the East Coast will significantly change that acoustic ecosystem. We know that the sounds from seismic air gun arrays propagate and change the acoustic environment through enormous areas.

We know that a close relative of right whales, the bowhead whale, starts to react to seismic noise at extraordinarily low levels and continues reacting until whales stop communicating altogether. The level of seismic air gun activity authorized by NMFS is irresponsible and likely to cause significant impacts on right whale acoustic behavior.

For right whales, such changes could likely increase mother-calf separations, decrease acoustic communication between whales, and influence acoustic behaviors that are essential for maintaining the population's social cohesion and integrity.

Thank you very much.

[The prepared statement of Dr. Clark follows:]

PREPARED STATEMENT OF DR. CHRISTOPHER W. CLARK

Thanks to Chairman Huffman and Ranking Member McClintock for inviting me to testify on the critically important topic of North Atlantic right whale and the potential impacts of noise from seismic airgun surveys on this highly endangered population. I am a biologist and engineer and the founding Director of the Bioacoustics Research Program (BRP) at the Cornell Lab of Ornithology, and the Imogene Johnson Senior Scientist in BRP and Graduate Professor in the Department of Neurobiology & Behavior at Cornell University. I have a long history of successfully working at the interface between science, applied engineering, industry, and regulations; all with the specific objectives of using science to understand the potential impacts of human activities on marine mammals and to inspire and enable

the scientific conservation of marine wildlife and habitats. I was the Chief Marine Mammal Scientist for the U.S. Navy's Whales 1993 dual-uses program, co-PI for the Low-Frequency Active Scientific Research Program (LFA-SRP), co-PI investigating the impacts of the Navy's mid-frequency active sonar on beaked whales, and lead the development and application of the near-real-time, auto-detection network for North Atlantic right whale acoustic monitoring in Boston shipping lanes (http://admin.nrwbuoys.org/, http://www.listenforwhales.org/). Up until my retirement from Cornell in December 2018, my research areas focus on the potential chronic influence of cumulative man-made noise sources on marine mammal distributions and behaviors. I remain deeply concerned about the continued loss of marine animal acoustic habitats as a result of multiple anthropogenic noise sources operating over large scales for extended periods of time. In collaboration with a small group of experts I am working to develop a new, ecologically based paradigm for evaluating and measuring biological risks from anthropogenic activities at individual and population levels.

Baleen whales are known for their remarkable abilities to sing and produce a wide variety of sounds for basic life function including communicating, foraging, mating, and navigating. Humpback whales were most likely the sirens of the sea whose songs were first heard by ancient mariners through the hulls and masts of their wooden ships. World War II initiated the dramatic development of underwater listening systems motivated by the need to detect, track and identify enemy submarines. Those early efforts at listening to the ocean for rare, but critical acoustic events indicative of a lethal aggressor were accompanied by a deluge of unknown sounds attributed to marine life. Who and what was responsible for all these sounds, and how could we be sure we could know which ones were biological and which were not? That acoustic detection challenge existed beneath a top-secret mantel throughout the period known as the cold war and remains today. However, beginning in the early 1970s, civilian scientists also started listening to the ocean. Today that effort has risen to the point where people outside the military are listening throughout large areas of the world's oceans with all types of recording systems throughout entire years. Furthermore, our technologies for analyzing those large data sets are becoming faster and more and more sophisticated. As a result, it is fair to say that the science of listening to the ocean has entered a period of expansive exploration of and rapid discovery in the bioacoustics of marine acoustic environments.

In 1971, Roger Payne and Scott McVay published a paper first describing humpback whale song compositions based on recordings collected by the U.S. Navy off Bermuda (Payne and McVay 1971). Humpback songs are melodic, complex and primarily composed in a frequency range that we can hear and appreciate. Today scientists are beginning to describe the complex culture of whale communication using humpback songs and how these reveal the global nature of population interactions. In 1971, Roger Payne and Doug Webb also published a paper postulating that prior to the advent of modern shipping, the songs of fin whales could be heard across an ocean basin (Payne and Webb 1971). Fin whale songs are monotonously simple and so low in pitch as to be below our hearing range. The hypothesis that whale voices could be heard across an ocean was almost too grand to believe. Furthermore, the notion that noise from commercial shipping might be interfering with whale communication seemed far-fetched and was essentially forgotten. A point to be made by these recollections is that we (scientists included) can only understand the consequences of something if we can observe it. In the early years of ocean listening, where, when and how we listened were so limited in scope that our understandings of the complexities of sound in the living ocean were based on a few small, disparate pieces. We listened to bays or along short stretches of coastlines for the sounds we wanted to hear and understand (Clark and Clark 1980; Tyack 1983), and usually based on what we already knew was there and what hypothesis we wanted to evaluate.

In 1993, after the collapse of the Soviet Union, along with a handful of other scientists, I was given access to the U.S. Navy's Sound Surveillance System (SOSUS). In those first days after my introduction to SOSUS, a Navy Commander helped me locate, track and record a singing blue whale out to distances of over a thousand miles. This memorable observation proved to me that the far-fetched Payne and Webb (1971) hypothesis was true: whales could be heard across an ocean basin. Commander Gagnon and I later published a paper on an extensive set of SOSUS observations on singing blue, fin, humpback and minke whales in the North Atlantic (Clark and Gagnon 2004). The SOSUS observation system that worked on ocean basin and decadal scales totally changed my comprehension of sound in the ocean. It expanded my experiential knowledge about whale acoustic behaviors from the traditional small scales of tens of miles and a few weeks into the much larger

scales of many thousands of miles and years. I have often remarked that my ocean listening experiences using old technology vs. the modern SOSUS technology, was like the difference between looking at the night sky with a toy telescope and the Hubble telescope. There were many important insights from those early SOSUS experiences, three of which stand out as monumental. One, I observed the immense distances over which sounds of different frequencies (i.e. pitches) traveled through the ocean's complex, refractive medium (Jensen et al. 1994). Two, I participated in a nearly continuous flow of discoveries that contradicted current thinking about where and when whales should occur in the ocean. Three, I witnessed the ubiquitous occurrence of human noises from commercial shipping and seismic explorations throughout enormous ocean regions. These experiences clearly demonstrated that our limited technologies and analysis tools, had significantly limited our abilities to observe the movements and behaviors of whales throughout their actual ocean-scale ranges. At the same time as I was having these incredible experiences listening at ocean basin scales, I started working with some of the world's best acoustic oceanographers as part of the Acoustic Thermometry of Ocean Climate (The ATOC Consortium 1998), which gave me the experience of learning about the intricacies of how, why and when low-frequency sound travels so efficiently through the ocean.

Those expansive insights occurred in the mid 1990s. Today, there is a growing community of scientists recording along the East Coast of North America, from the Gulf of Mexico to the Grand Banks of Canada, and much of this effort is dedicated to documenting the acoustic occurrence of right whales (e.g. Davis et al. 2017) throughout a significant portion of their home range. A significant increase in this acoustic effort along the East Coast has come from NOAA's scientific community that recognized that anthropogenic noises are affecting marine acoustic environments (Hatch et al. 2016) as well as the value of applied bioacoustics for monitoring, mitigation and management actions in support of the North Atlantic right whale population recovery. This NOAA scientific effort is complemented by a rising global awareness that anthropogenic noises are influencing acoustic environments, in general (Merchant et al. 2018) and impacting the acoustic habitats of specific populations (Williams et al. 2013), and must be included in assessments of cumulative impacts on marine wildlife (Williams et al. 2016, Lacy 2017).

Why is there so much concern about the potential influences of anthropogenic noise on marine mammals in general and the effects of seismic airgun array surveys on baleen whales specifically? There are two basic reasons. First, it has been known since the time of Aristotle, and repeatedly confirmed by scientific study that marine mammals depend on sound to survive. In particular, there is compelling evidence that baleen whales (like right whale) have acute very-low-frequency (<100 Hz) and infrasonic hearing (<20 Hz; Ketten 1994). In particular, right whales are specifically well-adapted to and dependent upon listening to sounds in the low-frequency register (Ketten 1997, Parks 2007) for critical life functions such as communicating, navigating, mating, and maintaining social bonds (e.g. between mothers and calves). Second, the very-low-frequency band (10–100 Hz) used by baleen whales overlaps substantially with the frequency bands in which seismic airgun energy is concentrated. In short, there are significant overlaps between whale sounds and the explosive noise produced by seismic airguns.

The occurrences of seismic airgun explosions from surveys throughout the North Atlantic have been well documented (Nieukirk et al. 2004) and are essentially unavoidable. This is true for recorders operating along the East Coast of the United States and Canada, even recorders on the continental shelf in relatively shallow water (<100m) (pers. obs). All of these seismic surveys were conducted far, far away from the recorders; for example, off the Scotian shelf of Canada (1200 km), on and off the shelf of Surinam and French Guiana (3800 km), and on and off the shelf of western Ireland (5000 km). The coincident occurrence of acoustically active baleen whales and seismic airgun surveys has been observed in multiple oceans in very remote parts of the world (e.g., Nieukirk et al. 2012). These types of surveys have been happening throughout the last 20 years. To my knowledge there is no complete and reliable inventory of the possible hundreds of surveys conducted during this period.

Explosions from seismic airgun surveys have been recorded throughout the oceans, which is not surprising because the acoustic energy is so high and the frequency content so low. As scientists we are still in the process of understanding the long-term, large-scale, chronic, biological consequences of these surveys. Because these surveys occur offshore in distant places and influence the ocean's acoustic environment over such enormous spatial areas (>200,000 km^2) and temporal scales (>60–180 days), assessing the full scale of a sub-lethal impact is challenging. Lack of data is not evidence of lack of impact, especially when the space and time scales

of existing observational schemes do not match to the scales of the seismic airgun noise. Papers reporting responses to distant seismic airgun noise by a species closely related to right whales are sobering.

This critical piece of evidence that raises my deep concern about seismic survey impacts on right whales comes from responses of bowhead whales (a species closely related to right whales) to seismic surveys (Blackwell et al. 2015). In that paper, the authors show that bowhead whale calling rates differ depending on the received level of airgun sounds from distant seismic surveys. Calling rates increased as soon as airgun pulses were detectable, then plateaued at increased received levels, began decreasing as received levels continued to rise, and then ceased entirely at levels that have been assumed to be approaching some sort of auditory harm. In other words, the whales have some capacity to first compensate for rising relative levels of noise exposure, but these levels are far below levels that have ever been of concern. They continue to have the significant response of decreasing calling rates at received levels that have only been of minor concern. In my opinion, these kinds of significant and consistent responses by an endangered species to seismic airgun sounds are alarming. Furthermore, there is nothing in any of the proposed monitoring or mitigation actions that could determine whether or not right whales modify their calling behavior in the face of noise from proposed seismic surveys. The inability to observe a likely response and therefore no data is not evidence of no response.

What do I know about right whale acoustic communication that leads me to be extremely concerned about North Atlantic right whales exposures to seismic airgun surveys?

For my PhD research, I conducted research on a population of southern right whales lived in the Golfo San Jose in southern Argentina. We simultaneously observed and listened to the whales every day for 18 months, for two full seasons in great detail. I designed, built and installed an array of bottom hydrophones (underwater microphones) that allowed us to know which whales made which sounds. We learned to associate certain types of sounds with different behaviors, and built a very simple form of a sound dictionary. Of particular importance, we observed that the whales produced a distinctive class of calls as a means of maintaining contact and coming together into social groups. We referred to these sounds as "contact calls," and we validated the biological importance of contact calls by conducting experiments in which we used an underwater loudspeaker to play back different types of sounds. In response to play back of contact calls, distant whales called back, and many of those whales swam to the location of our underwater loudspeaker. I referred to this as counter-calling. From watching and listening to the whales, and learning the personalities of the different individuals, I determine that right whales are highly dependent upon sound to maintain social contact. This includes mothers and young calves that must maintain close proximity in order for the calf to nurse and increase the chances of the mother being able to protect her calf from killer whales. This dependence is ultimately dependent on listening for sounds under naturally quiet conditions.

In 2001, I initiated an acoustic research project on North Atlantic Right Whales in Cape Cod Bay, MA for which our team from Cornell deployed arrays of bottom recorders that we could use to detect, locate and track calling whales (Urazghildiiev & Clark 2009). I did this in part because other right whale scientists had been studying right whales there for some time (e.g. Hamilton and Mayo 1990, Ganley et al. 2018). Early on we discovered that on days when only a few right whales were acoustically present in the bay, aerial surveys did not see any whales (Clark et al. 2010). Continued research on right whale acoustics by a growing number of scientists has shown that North Atlantic right whales produce contact calls and counter call (Parks et al). In Cape Cod Bay, I have observed cessation of right whale calling under high noise conditions as a result of both winter storms and shipping traffic. Calling right whales are detected throughout the year in regions and at times of year when they were not expected to occur (Hodge et al. 2015). Calling right whales are also detected far offshore where they were not expected to occur (Muirhead et al. 2018). What has happened over the last several decades is that the level of effort for acoustically observing right whales has expanded to include places along the entire East Coast, many as far out as the continental shelf break.

Consider this as evidence for concern: All right whale populations in the Southern Hemisphere for which there are population data are increasing, while the North Atlantic population is not (Corkeron et al. 2018). There are now years in which more calves are born into the population of right whales off the western South Atlantic than there are in the total population of right whales in the North Atlantic Ocean. One very obvious difference between the regions in which these two populations occur is the level of commercial activities that influence the very-low-frequency

marine acoustic environment; namely, the levels of anthropogenic noise from shipping traffic and seismic airgun surveys.

Finale: Right whales, as well as many marine animals (e.g. shrimp and commercial fishes), are highly dependent upon a naturally quiet ocean for basic life functions. Seismic airgun surveys off the East Coast will significantly change the natural dynamics of that acoustic ecosystem. We know that the sounds from seismic airgun arrays propagate and change the acoustic environment throughout enormous areas. We know that a close species relative of the right whale, the bowhead whale starts to react to seismic noise at extraordinarily low received levels and continues reacting until it totally stops communicating. The present level of seismic airgun activity authorized by NMFS, both in terms of the area covered by a single survey and especially in terms of multiple surveys, is incredibly irresponsible and has a legitimate likelihood of causing significant impacts on right whale acoustic behavior. For right whales, such changes will increase the likelihood of mother-calf separations, decrease the likelihood of acoustic communications between whales, and impact all those acoustic behaviors that are essential for maintaining the population's social cohesion and integrity. This is not about acute, physical harm to an individual. Rather, this is about the cost to a marginally surviving population as a result of aggregate chronic noise from seismic airgun surveys throughout large portions of the population's range throughout significant periods of the year.

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Mr. HUFFMAN. Thank you, Dr. Clark.

We will now move to questions for the second panel, and I will begin, recognizing myself for 5 minutes.

Dr. Clark, you are the expert on bioacoustics and the impacts of these things on North Atlantic right whales. Can you please address this claim we have heard, that acoustic sounds produced by seismic testing do not threaten the North Atlantic right whale?

We have heard, for example, that it is merely a sublethal impact, the implication being that that is no big deal. I would like you to speak to that.

Dr. CLARK. Thank you, Mr. Chairman. This is the disparity between saying that I do something that actually kills an individual—that is an acute impact—or I deafen them to the point that they are basically dysfunctional, versus a chronic impact. You all know what chronic impacts are like.

Mr. HUFFMAN. A chronic impact could still cause the extinction of a struggling species. Is that fair to say?

Dr. CLARK. A chronic impact will increase the stresses, like Dr. Kraus has talked about. Chronic impacts, we get chronic impacts from smoke, secondhand smoke, et cetera, et cetera. So, it is the constant, deliberate debilitation of the species.

Mr. HUFFMAN. Thank you. We have also heard that a more protective standard in the Gulf Coast is justified because the bathymetry and I guess the greater tolerance for acoustic noise in the Atlantic justifies a more relaxed standard. You heard that testimony. Do you agree with it?

Dr. CLARK. I think it is nonsense.

Mr. HUFFMAN. Dr. Kraus, you have authored more than 80 scientific publications on the right whale. Do you think the seismic testing poses an existential threat to this species? And why?

Dr. KRAUS. I do, and it is not because it causes mortality. The only time seismic activity would actually kill a whale would be, one, if the whale was really dumb or deaf. Generally, the activity is exactly as Dr. Clark pointed out. It is a chronic, long-distance, widespread impact. And there have been no actual studies that would actually answer the question about the long-term seismic impacts on populations because you cannot do those studies easily.

The short-term studies that have looked at the response of seismic activity by many different species of whale shows that nearly all of them respond. They hear it, but they just cannot do anything about it. So, in the case of right whales where you have an already stressed population with significant multiple impacts that are occurring at multiple levels, the addition of additional stressors is just a bad idea.

Mr. HUFFMAN. All right. Dr. Kraus, you know these whales individually better than anyone. Can you please tell us about the condition of the roughly 100 breeding females?

Dr. KRAUS. Female condition is measured by a series of both photographic and physiological measurements. And it turns out that of the animals that we have still alive, most of them are in a steady state of—they have been in a relatively slow decline over the last 30 years.

They have stabilized, but we know exactly what the threshold of reproduction is. And many of them are just above it, so that additional stressors can change their physiology, change stress responses in a way that would actually reduce their fitness and their ability to produce calves.

Mr. HUFFMAN. And Dr. Kraus, finally, why are the mitigation measures proposed by NMFS and its Incidental Harassment Authorizations insufficient to ensure the survival of the species?

Dr. KRAUS. The mitigation strategies employed for all of these seismic activities are a little bit of a lipstick on a pig. That is to say, they will prevent immediate mortality if a whale gets so close that it is going to get blown up. They will have nothing to do with mitigating the long-term impacts and the chronic elevation of ambient noise levels for hundreds of kilometers around the seismic vessel.

Mr. HUFFMAN. All right. Thanks very much for your testimony, all of the witnesses. I will now recognize the Ranking Member, Mr. McClintock, for 5 minutes.

Mr. MCCLINTOCK. Thank you, Mr. Chairman. The central issue in this hearing seems to be the effect of seismic testing on the North Atlantic right whale. The contention is that it is driving them to extinction.

Now, Dr. Burnett, coincidence obviously does not prove causation. But causation must show coincidence. Correct?

Dr. BURNETT. Yes. It should be, it is correlation. Yes.

Mr. MCCLINTOCK. Yet, we do not see coincidence with the population of other whale species in the North Atlantic; as we have heard, other whale species continue to grow in population in the

same region, several of the species having reached their pre-whaling levels.

So, if seismic activity was fatal to whales, would we not be seeing the same effect on other species' populations?

Dr. BURNETT. I cannot think of a reason why not. And you would find it in other right whale species in the Southern Hemisphere, where they are currently undertaking seismic testing.

Mr. MCCLINTOCK. We had a dramatic demonstration with the air horn, and it was annoying. The implication of this and the discussion that followed was that any fish or mammal species in the ocean is going to stay in the immediate proximity of this annoying phenomena. Is that a reasonable assumption to make?

Dr. BURNETT. Well, many will. Of course, when they tested in North Carolina, tests that the National Science Foundation also found did not pose negligible danger to sea species, some species abandoned the area for the time of the testing, and then came back into the area after the testing.

Mr. MCCLINTOCK. I think our common sense tells us that any fish or mammal population is going to move away from such an annoying sound. I think that the reaction of every person in this room, had it continued, would be to leave the room.

We learned today that seismic testing has been going on in the Atlantic for 80 years. Up until the last decade, we were actually seeing an increase in the population of the North Atlantic right whale, about 2.8 percent a year. What does that tell us about cause and effect?

Dr. BURNETT. Well, it tells us there doesn't seem to be a cause and effect on whale mortality and decline, that there are a number of factors. It turns out the Canadians are just now getting on board with some of the shipping things that we have been doing for a decade.

And that should hopefully reduce right whale mortality. I see no evidence, however, that limiting seismic testing—I see no difference between the seismic testing for wind, that would evidently be allowed, but not for oil and gas.

Mr. MCCLINTOCK. I am going to get to that in a moment, if I can. But while we are on the general subject of populations, a lot has been said that there are only 411 right whales left in the North Atlantic. Certainly, they number just in the hundreds. It gets worse if you look at the North Pacific right whale population; I am told they number only in the tens.

But in the Southern Hemisphere, they have a healthy population of 16,000, which is growing at about the pace that we are seeing of other whale species around the world. What does that tell us?

Dr. BURNETT. I guess I cannot honestly say for sure what it tells us. I don't know what the difference is—shipping lanes, fishing entanglement, and other factors that may be interfering with the recovery of the right whale here.

Mr. MCCLINTOCK. I should think so. And I again would imagine it may have something to do with the fact that the population in the North Atlantic was hunted almost to extinction. And when you have that small a population, it is very difficult for it to recover. Is that accurate?

Dr. BURNETT. I would suppose it is accurate. I would also suppose it might have implications for the genetic diversity within the species and perhaps genetic disorders from close interbreeding populations.

Mr. MCCLINTOCK. Point taken. We heard about inconsistency and politically motivated decisions. But again, as we know, the Obama administration issued many seismic testing permits, including in the Atlantic for Columbia University, USGS. Why are those permits good and the recent permits are bad?

Dr. BURNETT. That is my problem, I cannot explain the difference. It seems to be that seismic testing is bad for oil and gas but is good for everything else. And that is curious if what you are really concerned about is the right whale.

Mr. MCCLINTOCK. So, it is a double standard, then. It is not the seismic testing, it is the purpose of the seismic testing?

Dr. BURNETT. Correct.

Mr. MCCLINTOCK. And since science is based on data, and the purpose of seismic testing is to collect data, why would any scientist want to blind themselves to that, particularly as we have already established it has no effect on the populations of other whales?

Dr. BURNETT. I can think of no good reason.

Mr. HUFFMAN. The Chair now recognizes Mr. Van Drew.

Dr. VAN DREW. Thank you, Mr. Chairman.

Dr. Kraus, do you believe that multiple stressors and threats compound the impacts on the North Atlantic right whale?

Dr. KRAUS. I do. I think that we know that they are getting affected by ships and entanglements. But what we know less about is the sublethal effects of those entanglements and the sublethal effects of noise. We do know that they have physiological responses that indicate a stress response, and that stress response, when accumulated over time, is damaging.

Dr. VAN DREW. Let me ask you this: Did the National Marine Fisheries Service consider the suite of stressors already present? And did they assess whether the addition of seismic testing would further compound these stressors?

Dr. KRAUS. In my reading of the IHAs and the Biological Opinion, I did not see that.

Dr. VAN DREW. Well, then, what about the cumulative effect of five different companies doing systematic surveys?

Dr. KRAUS. I did not see that, either. They did not seem to combine the analysis.

Dr. VAN DREW. Dr. Kraus and Dr. Clark, both of you, the North Atlantic right whale population was growing as recently as the early 2000s, and on average, almost 25 calves were born each year. The population has been in decline since 2010, and now approximately less than 420 individuals remain.

In the 2017–2018 calving season, no new calves were observed. This year we have seen 7 births, but after 20 deaths. Since 2017, the population has not seemed to grow overall. In your expert opinion, would the use of seismic air gun blasting for oil exploration in the Atlantic be a potential threat to the survival of the species?

Dr. KRAUS. Who would you like?

Dr. VAN DREW. Both of you.

Dr. KRAUS. OK. My opinion is that it does represent a threat, largely because of the very quiet communications between mothers and calves, and the fact that half of the population equation is dependent. If we are going to bring this population back, it is going to be dependent upon right whales having enough calves to start to replenish the animals that are lost from the mortalities. In order to do that, we need to give the mothers and their calves every possible chance.

Dr. VAN DREW. OK. Thank you.

Dr. CLARK. Yes. I believe it is a threat. I have observed what right whales do when noise levels go up. Their communications stop. Their aggregation on food resources is—they go into random walks. Actually, they do not aggregate appropriately on food resources. And all of that has a serious potential impact on the animals' ability to gain recent fat and grow, and mothers to come into estrus and have calves.

Dr. VAN DREW. OK. Thank you very much. I would just like to point out that I do have legislation that would disallow the permitting of the five seismic studies. It is H.R. 1149. It is a bipartisan piece of legislation. It is called the Atlantic Coastal Economies Protection Act, and I welcome anybody who is interesting in joining on as a co-sponsor.

And I would like to yield the remaining time to the Chairman.

Mr. HUFFMAN. I thank the gentleman for yielding. The Ranking Member just asked a series of questions about right whale biology to a witness with a philosophy degree from a conservative think tank. Seems like we should maybe pose some of these questions to our right whale experts.

We have heard that right whales in the Southern Hemisphere are doing much better. We have heard that other whale species in the Northern Hemisphere are doing better. I am not sure what the implication is. Maybe our North Atlantic right whales are just defective and we should stop trying to protect them.

Dr. Kraus, you are the expert. Would you like to speak to these claims?

Dr. KRAUS. The right whales in the Southern Hemisphere tend to occur south of about 45 degrees south latitude, and they are south of most of the seismic activity in the Southern Hemisphere. The right whales in the Northern Hemisphere, by contrast, are actually quite in the middle of a lot of industrial activity—shipping, fishing, and a lot of stuff like that.

As other people have pointed out, there has not been any seismic activity in the Atlantic for the last 40 years except for very short periods of time. There is no comparability between the seismic activity in terms of sound source levels or extent or the time period or, rather, the duration of that activity between wind farms, between the geophysical surveys that the Langseth did off the coast, compared to the kind of magnitude and the number of ship-days involved in the proposed activity.

Mr. HUFFMAN. So, is it fair to say this would be a new and fundamentally different stressor at the worst possible time for this species?

Dr. KRAUS. And many times more—the magnitude is out of—it is completely different.

Mr. HUFFMAN. Thank you.

I want to thank the witnesses. We have reached the end of this hearing.

Mr. MCCLINTOCK. I would like to ask unanimous consent to insert into the Committee record the Status of Whales Report of the International Whaling Commission, and an April 2018 paper by John Droz regarding offshore fossil fuel exploration and development.

Mr. HUFFMAN. Without objection, those will be entered into the record.

One of the courtesies that Democrats routinely granted to a Subcommittee Chair, Mr. Gosar, was to allow a final 1-minute-or-less question to each of the witnesses on the panel, to ask them, essentially, "What is the one thing you were not asked that you wish you had been asked?"

I would like to request unanimous consent for my Republican colleagues to grant that same courtesy so that we could ask that final question to our panelists.

Mr. MCCLINTOCK. Well, Mr. Chairman, courtesy is as courtesy does. And unfortunately, because of your handling of my request for unanimous consent to borrow from accredited time to Mr. Webster, I am really not inclined to do that. This is outside the normal scope of the hearing and outside the House rules.

Mr. HUFFMAN. Well, I am disappointed that that courtesy will not continue under this Ranking Member.

But with that, I want to thank the witnesses for their valuable testimony, and also the Members for their questions. The members of the Committee may have some additional questions for the witnesses, and we will ask that the witnesses respond to those in writing. Under Committee Rule 3(o), members of the Committee must submit witness questions within 3 business days following the hearing. And the hearing record will be held open for 10 business days for these responses.

If there is no further business, without objection, this Committee stands adjourned.

[Whereupon, at 12:18 p.m., the Subcommittee was adjourned.]

[ADDITIONAL MATERIALS SUBMITTED FOR THE RECORD]

Submissions for the Record by Rep. Lowenthal

115TH CONGRESS
1ST SESSION

H.R. 3682

To direct the Director of the Office of National Marine Sanctuaries of the National Oceanic and Atmospheric Administration to create a Blue Whales and Blue Skies Program to reduce air pollution and harmful underwater acoustic impacts and the risk of fatal vessel whale strikes by recognizing voluntary reductions in the speed of vessels transiting the Greater Santa Barbara Channel Region, California, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

SEPTEMBER 6, 2017

Mr. LOWENTHAL (for himself, Ms. BROWNLEY of California, Mr. CARBAJAL, and Mr. KHANNA) introduced the following bill; which was referred to the Committee on Transportation and Infrastructure

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A BILL

To direct the Director of the Office of National Marine Sanctuaries of the National Oceanic and Atmospheric Administration to create a Blue Whales and Blue Skies Program to reduce air pollution and harmful underwater acoustic impacts and the risk of fatal vessel whale strikes by recognizing voluntary reductions in the speed of vessels transiting the Greater Santa Barbara Channel Region, California, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Blue Whales and Blue Skies Act".

SEC. 2. BLUE WHALES AND BLUE SKIES PROGRAM.

(a) IN GENERAL.—Not later than 12 months after the date of the enactment of this Act, the Director of the Office of National Marine Sanctuaries of the National Oceanic and Atmospheric Administration, in consultation with the Commandant of the Coast Guard, shall establish the Blue Whales and Blue Skies Program, to——

(1) reduce air pollution and harmful underwater acoustic impacts and the risk of fatal whale strikes by encouraging voluntary reduction in the speed of eligible vessels transiting the Greater Santa Barbara Channel Region; and

(2) annually award Blue Whales and Blue Skies Excellence Awards for verified successful participation in, and compliance with, the program by eligible vessels.

(b) PROGRAM REQUIREMENTS.—The Director shall——

(1) model the program after the pilot Vessel Speed Reduction Program administered by the Santa Barbara County Air Pollution Control District, the Ventura County Air Pollution Control District, the Channel Islands National Marine Sanctuary, the Environmental Defense Center (a non-profit corporation established under the laws of the State of California as in effect on the date of the enactment of this Act), and the National Marine Sanctuary Foundation, except the Director may not provide a financial incentive for participation in the program; and

(2) develop the program in consultation with the entities referred to in paragraph (1).

(c) ANNUAL AWARDS.——

(1) IN GENERAL.—Under the program, the Director shall annually award Blue Whales and Blue Skies Excellence Awards to owners of eligible vessels that have complied with the program during the preceding year.

(2) AWARD CONDITIONS.—As a condition of an award under this subsection, the Director shall require, at a minimum, that each eligible vessel of the awardee——

(A) transit the Greater Santa Barbara Channel Region at speeds of 12 knots or lower, or at a lower maximum speed as provided in guidance established under the program; and

(B) participate in the Port of Los Angeles or Port of Long Beach vessel speed reduction program, respectively, if the vessel calls at that port in the transit for which the award is considered.

(d) OFFICIAL SEAL.—The Director shall create an official seal to be recognized as the symbol of excellence in compliance with the program, that——

(1) may be used by shipping companies with eligible vessels for which a Blue Whales and Blue Skies Excellence Award is awarded under this section;

(2) includes the name of the shipping company;

(3) includes the year for which such award was made; and

(4) includes the percentage of transits through the Greater Santa Barbara Channel Region by eligible vessels of the shipping company in such year that were in compliance with the program, calculated as——

(A) the number of such transits, divided by

(B) the total number of transits through the Greater Santa Barbara Channel Region by all vessels of the shipping company in such year, excluding transits directed by the Coast Guard to proceed in excess of the speed requirements of the program.

(e) EXTENSION OF PROGRAM.—No later than 4 years after the date of the enactment of this Act, the Director shall——

(1) consider the feasibility of extending the program to encompass all shipping channels along the United States Pacific coast between Canada and Mexico; and

(2) report the findings and recommendations under paragraph (1) to the Committee on Transportation and Infrastructure and the Committee on Natural Resources of the House of Representatives, and to the Committee on Commerce, Science, and Transportation of the Senate.

(f) LIMITATIONS.—Nothing in this section shall be construed——

(1) to require participation in the program;

(2) to authorize appropriations for, or the provision of, any financial incentive for participation in the program; or

(3) to authorize any action that affects navigation safety.

(g) DEFINITIONS.—In this section:

(1) ELIGIBLE VESSEL.—The term "eligible vessel" means a vessel that has been approved by the Director to participate in the program.

(2) PROGRAM.—The term "program" means the Blue Whales and Blue Skies Program established under this section.

(3) GREATER SANTA BARBARA CHANNEL REGION.—The term "Greater Santa Barbara Channel Region"——

(A) means such portion of the geographic zone used by vessels transporting goods to transit the area surrounding the Channel Islands, including the Santa Barbara Channel, California, as is designated by the Director for purposes of this section; and

(B) includes, at a minimum, the geographic area identified in the pilot Vessel Speed Reduction Program referred to in subsection (b)(1).

June 19, 2018

Re: 2018 voluntary Vessel Speed Reduction (VSR) incentive program for the Santa Barbara Channel and San Francisco Bay Area regions off California

Dear Carrier Representative:

We are implementing a 2018 VSR incentive program July 1–November 15, 2018 to reduce air pollution and fatal ship strikes on whales. For the 2018 Program, financial incentives will be awarded to companies based on percent of distance traveled by their vessels through the VSR Zones at 10 knots or less, termed "percent cooperation," during the identified time period. Average speed of a transit throughout the entire VSR Zones must not exceed 12 knots in order to receive credit for distance traveled at 10 knots or less. Close to $300,000 is available for incentive awards and amounts will scale with the percent cooperation, and will range from $1,000 to up to $35,000 (or greater) per company. Overall there is less funding available for awards for the Bay Area than for the Channel region.

The California Marine Sanctuary Foundation will manage the incentive payments to individual shipping lines; please see the Letter of Understanding. Each vessel's speed transiting the VSR Zones will be verified via Automatic Identification System (AIS) data. Vessels that call on the Ports of Los Angeles and/or Long Beach must participate in one of the ports' VSR incentive programs.

In addition to the financial award for companies that meet requirements, we will work with successful shipping companies on a positive public relations campaign to draw public awareness to the VSR program and your company's participation. Participation is voluntary and does not commit shipping industry participants beyond the program period. If companies are enrolled in the program and unable to meet the minimum program criteria, there is no penalty but financial incentives will not be awarded.

Advantages to shipping companies of the 2018 incentive program structure include the following.

- The 10-knot target is consistent with the target speed for voluntary Whale Advisory Zones which overlap with VSR Zones.
- Sign up for shipping companies is greatly streamlined. Just provide a list of the vessels (with IMO and MMSI numbers, including charter or alliance vessels under the company's control) expected to transit one of the VSR Zones July 1–November 15, 2018.
- There is no longer a requirement that the vessel must have historically transited the region. Vessels that are coming to the region for the first time can be part of the program.
- There is no longer a requirement that previous transits must have been at higher speeds. The system is set up to reward companies with vessels already transiting at lower speeds.
- A fleet-based approach will also be used in the 2019 program next year.

While the scope of the program is limited to the Santa Barbara Channel and San Francisco Bay Area regions (see Attachment A), air pollution, greenhouse gas emissions, and the threat of ship strikes on whales extends beyond these regions. Every effort should be made by participating vessels to not increase speed over the registered vessel's historic baseline speeds while outside the VSR Zones to "make up time." Ship speed monitoring using AIS may occur between the Santa Barbara and San Francisco Bay Area region VSR Zones to determine if ships are speeding up between Zones.

Please note this VSR incentive program complements existing seasonal whale advisories in effect in the Santa Barbara Channel and San Francisco Bay Area regions. The National Oceanographic and Atmospheric Administration (NOAA) strongly recommends that all vessels 300 gross registered tons or larger reduce

speeds to 10 knots or less in these vessel slow speed zones. For more information on the seasonal whale advisories, please consult the Eleventh Coast Guard District Local Notice to Mariners.

To enroll in the program, companies will be required to sign a Letter of Understanding (see Attachment B) and provide the name and MMSI and IMO numbers for all vessels under the company's control which are scheduled to transit the VSR Zones during the program period (see Attachment C). To enroll your company, please return the completed and signed Letter of Understanding (Attachment B) and fillable PDF Sign Up Form (Attachment C) to Lindsay Marks of NOAA Channel Islands National Marine Sanctuary (contact information provided below). Please enroll by June 30th if possible and no later than July 10, 2018.

For more information about the VSR incentive program, watch "Protecting Blue Whales and Blue Skies," a promotional film found at https://www.ourair.org/air-pollution-marine-shipping/. Please also see Attachment D to learn how to report sightings of endangered whales.

Enrollment materials, comments or questions may be directed to:

Contact: Lindsay Marks
Address: NOAA Channel Islands National Marine Sanctuary
University of California Santa Barbara
Ocean Science Education Building 514, MC 6155
Santa Barbara, CA, 93106–6155
Phone: +1 (805) 893–6425
Fax: +1 (805) 893–6438 (ATTN: Lindsay Marks)
Email: lindsay.marks@noaa.gov

We believe by working together we can maintain vibrant maritime commerce, enhance corporate responsibility, and protect human health and the marine environment. We thank you in advance for considering your company's participation in the VSR incentive program.

Sincerely,

The Partners in the Vessel Speed Reduction Incentive Program for 2018
in the Santa Barbara Channel and San Francisco Bay Area regions

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Submissions for the Record by Rep. McClintock

IWC | International Whaling Commission > Whales > Population Estimates

Whale Population Estimates

The International Whaling Commission's most recent information on estimated abundance

On this page

Population table	The IWC's figures for estimated whale populations
Comprehensive Assessment	The comprehensive assessment of current whale stocks
Status of whales	A brief overview of the 'status' of whale populations

Estimates

Good conservation and management requires and understanding of the status of populations. A key component of this is, of course, an estimate of present abundance (and ideally trends in abundance) against which possible threats can be evaluated.

Estimating the abundance of animals that spend most of their time below the surface is difficult. The Scientific Committee has developed guidelines on how to best estimate abundance of whales from ships and aeroplanes for use in the RMP. Other methods include a combination of visual and acoustic techniques (e.g. bowhead whales off Alaska) or mark- recapture techniques using the natural marks found on some species that allow individuals to be identified (e.g. humpback whales in the North Atlantic). Because of the considerable scientific uncertainty over the numbers of whales of different species and in different geographical stocks, the International Whaling Commission decided in 1989 that it would be better not to give whale population figures except for those species/stocks which have been assessed in some detail. This does not mean that there are not other published estimates of some species or populations or areas.

The Scientific Committee is undertaking a major compilation and review of abundance estimates that is expected to be completed by mid-2013. Meanwhile, below is a selection of approximate 'best' estimates (and their associated approximate 95 % confidence intervals) for some species and areas.

Top

MINKE WHALES

	Year(s) to which estimate applies	'Best' estimate	Approximate 95% CI
Southern Hemisphere	1985/86-1990/91	720,000	510,000 - 1,010,000
	1992/93-2003/04	515,000	360,000 – 730,000

North Atlantic			
Northeastern	1989	64,000	50,000 - 80,000
	1995	112,000	95,000 - 130,000
	1996-2000	80,000	65,000 - 100,000
	2003-2007	81,000	60,000 - 110,000
	2008-13	90,000	60,000 - 130000
Central	2005-2007	50,000	30,000-85,000
West Greenland	2007	17,000	7,000 – 40,000
North Pacific			
North West Pacific and Okhotsk Sea	1989-90	25,000	12,800 - 48,600
	2003	Ca 22,000+	Under review

BLUE WHALES

	Year(s) to which estimate applies	**Approximate point estimate**	**Approximate 95% confidence limits**
Southern Hemisphere (excluding pygmy blue)	1997/98	2,300	1,150 - 4,500

The estimated rate of increase is 8.2% (95% confidence interval 3.8-12.5%) per year between 1978/79 and 2003/04

FIN WHALES

	Year(s) to which estimate applies	**'Best' estimate**	**Approximate 95% CI**
North Atlantic			
East Greenland to Faroes	1987-9	15,000	11,000 – 20,000
	1995	22,000	16,000 – 30,000
	2001	26,000	20,000 – 33,000
	2007	22,000	16,000 – 30,000
West Greenland	2007	4,500	1,900 – 10,000

GRAY WHALES

	Year(s) to which estimate applies	**'Best' estimate**	**Approximate 95% CI**
North Pacific			
Eastern	1997/98	21,000	18,000 – 24,000
	2000/01	16,500	14,000 – 18,000
	2001/02	16,000	14,000 – 18,000
	2006/07	19,000	17,000 – 22,000
Western	2007	121	112 - 130

BOWHEAD WHALES

	Year(s) to which estimate applies	'Best' estimate	Approximate 95% CI
North Pacific			
Bering-Chukchi-Beaufort Seas stock	2001	10,500	8,000 – 13,000
	2004	12,600	8,000 – 20,000
	2011	17,000	15,700 - 19,000
North Atlantic			
West Greenland feeding area	2012	1,300	900 – 1,600

The net rate of increase of this population since 1978 has been estimated as about 3.2% per year (95% confidence interval 1.4% - 5.1%).

HUMPBACK WHALES

	Year(s) to which estimate applies	'Best' estimate	Approximate 95% CI
Southern Hemisphere			
Partial coverage of Antarctic feeding grounds	1997/98	42,000	34,000 – 52,000
Eastern South America	2005	6,200	4,600 – 8,500
	Rate of increase of around 7%		
Western South America	2003-4	2,900	2,000 – 4,200
Western Australian	2008	29,000	24,000 – 40,000

	Year(s) to which estimate applies	'Best' estimate	Approximate 95% CI
	Rate of increase of around 10% 1999-2008		
Western Africa	2005	9,800	7,000 – 12,000
	Rate of increase of around 4-5%		
Eastern Africa breeding stock(s)	2006	14,000	11,000 – 19,000
North Atlantic			
Western North Atlantic	1992-93	11,600	10,000 – 13,500
West Greenland	2007	2,700	1,400 – 5,200
	Rate of increase of around 9% 1984-2007		
North Pacific	2007	22,000	19,000 – 23,000
Arabian Sea	2007	80	60 - 110

RIGHT WHALES

	Year(s) to which estimate applies	'Best' estimate	Approximate 95% CI
Southern Hemisphere	2009	12,000	
Southwest Atlantic	2009	3,300	
	Rate of increase around 7%		
Southern Africa	2009	3,900	

	Year(s) to which estimate applies	'Best' estimate	Approximate 95% CI
	Rate of increase around 7%		
Sub-Antarctic New Zealand	2009	2,700	
South central and Western Australia	2009	2,000	
	Rate of increase around 7%		
North Atlantic	2010	490	

BRYDE'S WHALES

	Year(s) to which estimate applies	'Best' estimate	Approximate 95% CI
North Pacific			
Western	1999-2002	21,000	11,000 – 38,000

Pilot Whales

	Year(s) to which estimate applies	Approximate point estimate	Approximate 95% confidence limits
Central & Eastern North Atlantic	1989	780,000	440,000 - 1,370,000

Comprehensive Assessment

When, at its 1982 meeting, the IWC agreed to a pause in commercial whaling (or to use popular terminology, a 'moratorium') from 1986, the amendment to the regulations included a clause that 'the Commission will undertake a 'comprehensive assessment' of the effects of this decision on whale stocks and consider modification of this provision and the establishment of other catch limits'.

The term 'Comprehensive Assessment' had not been defined by the Commission and eventually the Scientific Committee defined it to be:

> 'an in-depth evaluation of the status of all whale stocks in the light of management objectives and procedures . . . that . . . would include the examination of current stock size, recent population trends, carrying capacity and productivity'.

To date the Committee has completed or is still undertaking such in-depth analyses of:

- Antarctic minke whales—Southern Hemisphere;
- Common minke whales—North Atlantic; western North Pacific
- Fin whales—North Atlantic
- Humpback whales—Southern Hemisphere and North Atlantic
- Bryde's whales—western North Pacific
- Bowhead whales—Bering-Chukchi-Beaufort Seas
- Blue whales—Southern Hemisphere
- Sei whales—North Pacific

Offshore Fossil Fuel Exploration and Development:
A Review of Some Concerns

By John Droz, Jr.*
April 28, 2018

Environmental activists have expressed strong opposition to all U.S. fossil fuels—offshore and onshore . . . *Every* energy source has benefits and liabilities. The only sensible way to determine what our best energy choices are, is to do a *comprehensive* and *objective* assessment of ALL the **pros** and **cons** of each option. Only then are we able to make an informed, science-based decision. This document is a contribution toward such an assessment.

*John Droz, Jr. is an independent physicist, an internationally known energy expert, and a NC resident. For a more complete bio and acknowledgements, see the end of the last page.

This paper presents some different perspectives about several assertions made by NGOs in the offshore fossil fuel debate. The focus is on North Carolina, which is estimated to have the largest offshore natural gas and oil reserves on the East Coast. We begin by outlining the main NGO concerns, and then follow that with a brief discussion of each item . . .

1. Seismic surveying will result in serious ecological damage. No, similar seismic surveys have resulted in no consequential environmental problems.

2. An oil spill is inevitable. For several reasons, an oil spill is extremely unlikely.

3. Offshore drilling puts the vital coastal tourism industry at risk. Offshore wind energy is a much greater threat to coastal tourism.

4. More jobs will come from offshore wind energy than from offshore fossil fuels. This is not likely to be true, but it is an irrelevant argument anyway.

5. Professional NC fishermen oppose coastal fossil fuel exploration and development. The NC Fisheries Association has officially endorsed offshore fossil fuel development.

6. There isn't enough oil and natural gas off the NC coast to justify the risk and the expense. No one knows the true economics, which is why a seismic survey is needed.

7. Drilling would result in some of the NC coast looking like Louisiana or Galveston, Texas. Considerable federal, state and local regulations mean that would never happen.

8. Revenue-sharing with the coastal States has not been approved. It is very likely that such revenue-sharing will be approved by the Trump administration.

9. Any oil and gas we discover will probably be exported anyway. Some resources will undoubtedly be exported, and that's good for our economy and our national security.

10. We have better U.S. energies available to us. If we exclude all the energy options the NGOs have blackballed (e.g. nuclear), there are no better choices left.

11. We don't need fossil fuels as we can live on 100% renewable energy sources. This is a 100% impossible scenario for multiple technical and economic reasons.

12. To effectively combat climate change, fossil fuels need to stay in the ground. This makes little sense as the NGOs' energy plans do not truly combat climate change anyway.

> *Part of the reason that our politics seems so tough right now (and facts and science and argument do not seem to be winning the day all the time), is because we're hardwired not to always think clearly when we are scared.*
>
> —Barack Obama

SOME BACKGROUND: In January 2015, the Obama Administration's Department of the Interior (DOI), Bureau of Ocean Energy Management (BOEM) issued a proposed 5-Year (2017–2022) Oil and Gas Leasing Program that included waters off the coast of the Mid and South-Atlantic Region (offshore Virginia, North and South Carolina, and Georgia). Revenue-sharing (of potential lease-payments, rents and royalties) with the States was **not** part of the proposal for the Atlantic area. After public hearings, BOEM subsequently removed the Atlantic area from the draft leasing plan. Just before leaving office, the Obama Administration denied permits for seismic surveying in the Atlantic area.

Rather than wait for the next 5-year plan (2023–2028), the Trump Administration proposed replacing the 2017–2022 plan with a modified 2019–2024 plan. On January 4, 2018, the DOI announced the next steps for developing the National OCS Leasing Program. The Draft Proposed Program "includes 47 potential lease sales in 25 of the 26 planning areas (19 off the coast of Alaska, 7 in the Pacific Region, 12 in the Gulf of Mexico, and 9 in the Atlantic Region)." The new Administration also reversed the decision concerning seismic surveying, putting the earlier applications to conduct these surveys back into play. As the National Ocean Industries Association's (NOIA) statement of support conveys quite well, it is important to understand that the current process is **extremely** cautious . . .

> This is the second step in a multi-year process that will determine a future **leasing** schedule, **NOT** a future **drilling** schedule. The process involves several rounds of public participation and several layers of environmental review. Once the leasing program is finalized (many months from now), future decisions on possible drilling must undergo their own series of public and environmental

reviews. Similarly, any future efforts to actually produce offshore oil and natural gas will be subject to yet another round of reviews.

Given these developments, now is a good time to step back and critique some of the common concerns put forward by the opponents of oil and natural gas exploration in the Atlantic (like Oceana and the Sierra Club). This paper is being prepared with the hope that a constructive, informed discussion of these issues will lead to better public understanding, and ultimately to better public policy outcomes.

The following is an assessment of commonly voiced NGO themes periodically expressed at public hearings about Atlantic offshore oil and natural gas exploration and development.

1—Seismic surveying will result in serious ecological damage. The opponents of offshore fossil fuel exploration try to demonize a seismic survey by calling it seismic "air gun blasting." It's unfortunate that this technical matter has been mispresented to the public this way, as it makes having a rational discussion about its pros and cons, very difficult.

One fact is that a comprehensive Atlantic Coast geological seismic survey has not been done in almost 40 years. Seismic survey technology has advanced significantly during that time. Because it has been so long since a survey was done, we have little understanding of the natural gas or oil resources off the U.S. Atlantic seaboard. *We need better information so that our positions and critical public policy decisions are based on the best available facts.*

Opponents claim seismic surveys pose grave threats to marine mammals, fish stocks, and especially to the endangered North Atlantic Right Whale. However, the current plight of the right whale and other endangered ocean species cannot be blamed on the fossil fuel industry, as that industry has not existed off the U.S. East Coast in decades. On the contrary, the Right Whale got its name because it was the "right" whale to kill for its blubber, which could be rendered into whale oil and other products. The advent of the fossil fuel industry actually saved whales from extinction by allowing substitution of kerosene and other petroleum products for whale oil, etc.

NOAA's *National Marine Fisheries Service* (NMFS) says the main threats to endangered marine species are: collisions with commercial and recreational vessels, entanglements in commercial and recreational fishing lines and nets, and ingestion or entanglement in garbage (primarily plastic). Most of these things are related to the tourism or fishing industries. *Where are the Resolutions and public protests about those proven environmental impacts?*

NMFS made this 2014 statement about the environmental impact of seismic surveys: "To date, there is no evidence that serious injury, death, or stranding by marine mammals can occur from exposure to air-gun pulses, even in the case of large air-gun arrays." BOEM's chief environmental officer issued a 2014 report stating: "*To date, there has been no documented scientific evidence of noise from air-guns used in geological and geophysical seismic activities adversely affecting marine animal populations or coastal communities.*" Note that both of these conclusions came during President Barack Obama's environmentally friendly terms.

The Lamont-Doherty Earth Observatory (the top U.S. academic seismic authority) recently conducted a NC seismic survey (e.g. re plate tectonics, etc). It covered a much wider area (2± to 200± miles from the NC coast *vs*. 10± to 50± miles for fossil fuel exploration for the entire NC coast: see here, p 4–6). Both seismic surveys are done with the same type of ships and equipment, with minor technical differences. Interestingly the academic geological surveys send stronger signals **deeper** into the ocean bed, as natural gas and oil reserves are shallower. This National Science Foundation (NSF) study discusses the environmental impact of the Lamont-Doherty seismic survey. NSF concluded this seismic survey caused no consequential harm to the NC ocean's eco-system . . . Lastly if seismic surveys are so environmentally problematic, where are the NGOs objections to the seismic surveys needed to site offshore wind turbines?

2—An oil spill is inevitable. As one writer put it, "if you drill, you're going to spill." This perspective is a classic example of a well-known logical fallacy: if "X" happens, then "Y" is certain to follow. However, correlation is not the same as causation. Those who oppose offshore fossil fuels assume right from the beginning that the worst outcome (a BP Horizon type of accident), is inevitable. In reality, consequential oil spills resulting from drilling accidents are exceedingly rare. Offshore exploration and development can be done safely and is being done safely all over the globe. A spill is **not** inevitable.

The BP Horizon accident was an unfortunate anomaly. The accident cost BP $65± billion in fines, restitution, and compensation, making it clear that an offshore accident today could mean financial ruin, even for the largest companies. None of these successful businesses wants to go bankrupt, so everyone involved (companies, equipment manufacturers, regulatory agencies, academic researchers, etc.) have become more risk averse than ever before. Extensive and unprecedented consultation among all these stakeholder groups over the past six years (including NGOs) unleashed an extensive analysis and evaluation of the causes of the BP accident, and a comprehensive review of all dimensions of the offshore program (from industry standards and best practices to design requirements and operational procedures for critical equipment).

This analysis and evaluation resulted in a relatively recent **major** overhaul of U.S. offshore drilling regulations. The Obama Administration DOI 2016 press release accompanying the implementation of its new well-control regulations states:

> ". . . the final rule addresses the full range of systems and equipment related to well control operations, with a focus on blowout preventer requirements, well design, well control casing, cementing, real-time monitoring and subsea containment. The measures are designed to improve equipment reliability, especially for blowout preventers and blowout containment technologies. The rule requires operability of equipment through rigorous testing and provides for the continuous oversight of operations, all with the goal of improving the reliability of equipment and systems to protect workers' lives and the environment from the potentially devastating effects of blowouts and offshore oil spills."

The Trump Administration is working with industry experts to ensure that these changes further increase safety (e.g. here). Life is about managing risks, as there are risks in every human endeavor. For example, tens of thousands of U.S. citizens die every year in traffic accidents, yet we still drive our vehicles. Accidents are not inevitable and the risks can be managed. The number of oil spills from all sources, and the volumes of oil involved, have fallen considerably, decade by decade in the past 30 years, in spite of the 40 million barrels per day increase in world oil output and consumption that occurred over the same time. As a result of new rules and regulations, and the financial penalties facing those involved, offshore drilling is unquestionably safer today than ever before, especially in the U.S.

3—Offshore drilling puts the vital coastal tourism industry at risk. This claim ignores many realities: the extremely low likelihood of a consequential oil leak ever happening, that the rigs would be 40± miles off the coast, that the ocean currents would not be bringing any oil spill to shore, and more. Further, a recent study by NCSU specifically asked NC coastal visitors two questions: **a)** are you in favor of wind energy [*most said YES*], and **b)** would you do the same vacation in a NC coastal community where wind turbines were visible [*80% ± said NO*]. If drilling opponents are sincere about their concern for the NC coastal tourism business, where is their organized and vocal opposition to wind turbines being visible off the NC coast?

4—More jobs will come from offshore wind energy than from offshore fossil fuels. The discussion surrounding the number of jobs, the types of jobs, and the location of jobs likely to be created by offshore fossil fuel development, ranges from confusing to silly. To begin with, we don't choose our energy supplies by the number of jobs they create! Instead, our energy options are selected based on **reliability, actual cost to ratepayers, true cost to taxpayers, proximity to demand centers, dispatchability**, etc.

Even if we did focus on jobs, we would be better off choosing the energy options that require the *least amount of labor per BTU*, because they are also likely to be the least expensive and most efficient. This study concluded that it takes 7± wind energy workers to produce the same amount of electricity that 1 fossil fuel worker can produce. That said, the political attraction of job creation is understandable, and we know that many politicians live and die by economic indicators. Kissing babies and promising jobs are two political tactics that never go out of style.

Opponents of drilling have disputed fossil fuel industry employment claims as speculative—yet they accept the job claims of wind energy lobbyists at face value. Here's how the numbers likely compare: a projection for NC jobs resulting from offshore wind energy is 20,000±. The latest projection for NC jobs from offshore fossil fuels is 55,000±.

Until we have a better understanding of the reserves off our coast, we can't be certain about its job creation. It all depends on where a seismic survey shows oil

and natural gas resources located, and the quantities that can be economically recovered with current technologies.

Exploration and development of fossil fuels, if and when it goes forward, will create many high-paying jobs in the legal, accounting, engineering, environmental, and regulatory and compliance fields. NC's solid manufacturing base, which already supplies many sophisticated components to the fossil fuel industry, would see more activity, and our world-class research institutions put us in a good position to benefit from offshore development. (Here are some videos for sample career possibilities.) A good parallel is what has happened further up the Atlantic coast, in Canada. See this detailed economic study about the broad and substantial economic benefits experienced there. For more information see "North Carolina Offshore Oil and Gas Roadmap," prepared by the NC Energy Policy Council, December, 2016.

5—Professional NC fishermen oppose coastal fossil fuel exploration and development. This is a misunderstanding. The North Carolina Fisheries Association (NCFA) recently brought this issue to their board again (as it had been discussed before). Although on most issues they almost always have dissenting votes, in this case the 17 member board *unanimously* supported NC offshore fossil fuel exploration and development. Here is their official position statement about offshore fossil fuels. This is a story about their position and the NC Governor's statement.

What is undeniable is that fishermen have been overwhelmingly opposed to offshore wind turbines (e.g. see here and here). There have been several studies (e.g. here and here) that have documented the environmental impact from turbine construction (e.g. significant sounds resulting from pile driving enormous bases, hundreds of feet into the ocean floor). Additionally there have been many reports of whale beachings and deaths that have been attributed to the infrasound generated by these 700± foot tall industrial structures (e.g. see here and here).

6—There isn't enough oil and natural gas off the NC coast to justify the risk and the expense. Drilling opponents say the old U.S. Geological Survey (USGS) estimates the amounts of fossil fuel reserves in the mid-Atlantic are so small that they won't matter, so it's not worth the trouble, risk and expense to go after them. That assertion ignores two studies, by independent academic experts (both PhDs), that both came to the opposite conclusion. This article says:

> "Mike Walden, an economist at North Carolina State University, did a cost-benefit analysis of offshore energy exploration. University of Wyoming economist Timothy Considine also did a detailed analysis. Both looked at estimates of offshore energy reserves, a range of estimates for future market prices, and the potential effects of oil spills or other problems.
>
> "While using **different** methodologies, Walden and Considine came up with similar results, as Walden explains in his recent book (and here). The scenario Walden described as most likely suggested that offshore drilling would boost North Carolina's gross domestic product by $1.9 billion a year, its permanent employment by about 17,000 jobs, and annual government revenues by $116 million. In Considine's mid-range scenario, his growth projections were $1 billion in GDP, about 15,000 jobs, and $171 million in revenues. *{Ed note: in their economic figures, Considine assumed State revenue-sharing, while Walden did not.}*
>
> "What about the environmental risks? Using standard assumptions and historical probabilities, the two scholars came up with projections denominated as dollars of GDP. Walden put the potential cost of spills at $83 million a year. Considine computed a broader range of potential environmental costs, including emissions, at $92 million a year."

The truth of the matter is we don't know exactly what reserves are there. There haven't been any NC offshore energy surveys for 40± years, and the technical advances in seismic surveying for oil and natural gas resources achieved since then (e.g. high resolution 3D) have never been applied in this region. Let the companies that take the economic risks make the economic decision whether or not to walk away. All indications are that the economics do make sense. This 2018 report estimates that there will be some **$260 Billion** in economic benefits to Atlantic Coast states to develop their fossil fuel reserves—and North Carolina is far and away the big winner.

Given the long lead times required to lease, explore, develop and license production from new fields, it is extremely important that we have a better understanding of the scale of the resources off our coast. The earliest anything would be likely to be produced will be beyond 2030, and who knows what the market will be like then? If there aren't any commercial deposits in the Atlantic OCS, policy makers and the

industry need to know that so they can focus their attention and resources on other options. A new seismic survey would put the uncertainty to rest.

7—Drilling would result in some of the NC coast looking like Louisiana or Galveston, TX. Opponents of drilling play this card several ways. On the one hand they claim that we may lose our beautiful beaches, clean water, wildlife habitats, and pristine environment to unbridled industrialization. On the other hand, the very same people often argue about the job creation benefits of industrialization. They can't have it both ways. As in several of the examples before, the truth is somewhere between these extremes. A lot depends on what resources are out there, how much is out there, and where it is, but there are many other forces at work that will also have an impact.

For multiple reasons, Texas/Louisiana type of oil and gas infrastructure is highly unlikely to be constructed along the NC coast. Much of NC's shoreline is comprised of state, local and national parks, wetlands, areas of environmental concern, wildlife sanctuaries, and critical habitats. There is also unlikely to be any suitable tracts of NC coastal land for this type of industrialization. Further, the land that is available is simply too expensive for this type of use.

Additionally, we now have an exceptional amount of federal, state, and local government regulations in place addressing all aspects of development. Many of the commercial projects we take for granted (like the Morehead City port, marinas and channels, and a multitude of ocean front structures), probably could not be built today. Just consider the recent fight over the Titan America cement plant in Wilmington, or the time it took to get agreement on a replacement for the Bonner Bridge (OBX). Our governing bodies currently have sufficient authority to protect our communities from the kinds of development that a majority of residents don't want to see.

Above all, we should not be worried about over-industrialization because these companies aren't stupid. Why enter a prolonged legal battle through an ever-changing forest of regulations and public opposition to build something not needed? Our oil demand has been below 2005 levels and it is expected to remain that way in the coming years. Outside of a few small specialty units, the U.S. hasn't built a large scale new refinery since 1977. We have more than enough refining capacity to meet our needs. If something changes, it's cheaper and easier to invest in the modernization of our existing refineries. If we discover natural gas, it could be processed offshore and shipped as LNG to markets, or it could be brought ashore by pipelines that would be buried out of sight. See again, the "North Carolina Offshore Oil and Gas Roadmap".

8—Revenue-sharing with the coastal States has not been approved. The basics are that the Submerged Lands Act of 1953 provides states with the rights to the natural resources (and associated revenues) of submerged lands within three nautical miles of their coasts. (For Florida's western coast, this jurisdiction extends nine miles.) Beyond states' jurisdiction, submerged lands are administered by the federal government for 200± nautical miles, in accordance with accepted international law. These lands are commonly referred to as the Outer Continental Shelf (OCS). BOEM is the federal agency responsible for this territory.

Drilling opponents say that to make the potential issues with offshore drilling worth considering, affected states should get a "revenue-sharing" deal with the federal government. Such sharing would be of income from potential lease-payments, as well as rents and royalties for any offshore fossil fuel leases.

In the prior administration's plan, there was **no revenue-sharing** between the federal government and the States, as a part of the proposal for the Atlantic area. The issue of revenue-sharing between the Federal Government and States (outside of the Gulf of Mexico) remains to be decided. However, the political reality is that President Trump is amenable to revenue-sharing of offshore fossil fuel development with affected coastal states, so this is likely a non-issue. See this good discussion. This presentation and this article are both instructive. Note: no revenue sharing has been approved for offshore wind energy, so where is the NGOs' objection?

9—Any oil and gas we discover will probably be exported anyway. The U.S. became a net exporter of some petroleum products (diesel, gasoline, jet fuel, etc.) a few years ago, and Congress recently repealed the long-standing ban on exports of crude oil. However, the U.S. is still a net importer of crude oil and petroleum products taken together. Exports and imports of crude oil and petroleum products help us balance the changes in consumer demand for products that take place seasonally and over time. They also help us match different crude oil stream's physical characteristics with various refinery configurations to maximize output of higher-value

products. Crude oil produced 50± miles off our coast probably would be pumped directly into tankers and sent to refineries here or abroad, and that is a good thing.

The product created from a given economic activity doesn't have to be consumed where it's produced in order for it to provide benefits. This is like saying that all the fish caught in NC waters have to be eaten here in NC in order for us to benefit from fishing, or that all the phosphate mined in Aurora (NC) has to be used in Aurora for that community to benefit from that mining. This is a red herring, as it simply is not true. Oil, and natural gas (*via* Liquefied Natural Gas: LNG), are internationally traded commodities whose prices are determined in a global marketplace. An increase in supply anywhere will affect supplies and prices everywhere.

The shale revolution has made it possible for the U.S. to become a net exporter of oil and natural gas, which provides many strategic benefits for us and our allies. U.S. exports of natural gas are lessening Europe's dependence on Russian gas imports. This recent typical story is about severe LNG shortages in Europe. **Half** of Britain's imported LNG now comes from Russia!

In other words, NC offshore gas production would help our **national security**, as it would limit Russia's earnings from selling LNG (to Europe and even the U.S.!). That income often funds Russian agendas at odds with our own objectives. This report makes clear the geo-political power of U.S. gas resources. This perspective is supported by this 2018 Congressional Report which documents that Russia is meddling in our energy markets—with the same objective as the NGOs have: *to discourage the U.S. from developing its valuable fossil fuel resources*.

10—We have better U.S. energies available to us. We may indeed have better energy options available to us, however, the same NGOs that oppose offshore fossil fuel exploration and development, also strongly oppose: nuclear, hydroelectric, coal, gas fracking. What's left? Wind and solar. Regarding electricity generation, it takes considerable imagination and chutzpah to call these unreliable, dilute, expensive options "better" than conventional sources (e.g. natural gas).

To try to justify this illogical conclusion, the NGOs say that we need to include the *external* costs of fossil fuels. Of course, they never apply this criteria to wind and solar, as the external costs of those are significant. Additionally it only makes sense to consider externalities, if we are *objectively* and *comprehensively* looking at the **benefits** *and* **liabilities** of each of our energy options. Any such comparison would conclude that fossil fuels have a superior NET externality—which is why the NGOs never do such an analysis. So if the NGOs involved here are believed to have energy competence, then no, we do not have better U.S. energy options available.

11—We don't need fossil fuels as we can live on 100% renewable energy sources. This is one of the silliest of the arguments. This type of claim is made to take advantage of the fact that most citizens are technically challenged—i.e. they simply don't understand electric grid realities.

For example, there is no such thing as wind energy by itself. Due to its unrelenting, unpredictable and uncontrolled output, wind energy must be permanently paired with a balancing conventional fuel source, which almost always is Gas (i.e. natural gas). So, what actually exists in the real world is a Wind+Gas package. In other words, the more wind we have, the more Gas we need to balance it. A similar situation exists for solar power.

The Buck Rogers claim that this renewable energy balancing will done by batteries, is too fanciful to take seriously. The discovery, development, manufacture, and deployment of economical large-scale batteries to bring about 100% renewables is not even in the foreseeable future. Even ardent supporters of renewable energy (like Bill Gates) recognize the limitations of today's renewable technologies. Gates likened trying to run a modern economy on 100% renewable energy to "trying to put a man on the moon by stacking ladders one on top of another."

In addition to the intermittency of renewables, another real-world problem is their diluteness. In other words, it takes an enormous number of wind turbines to even roughly approximate the average output of a single gas well. For example (see here), to match the energy output of the proposed NC offshore Manteo Prospect gas facility, it would take 7700 offshore wind turbines—covering an area the size of the state of Rhode Island! The environmental, commercial fishing, shipping, military, etc. impacts of such an enormous wind project, would be extraordinary. (As just one example, these turbines would interfere with radar for commercial airline traffic, as well as for military operations: see here.)

Another reality-check fact is that offshore wind energy is four to five times the cost of conventional energy. Countries with the highest percentage of renewables, also have the highest cost for electricity. For example, Denmark has a lot of wind

turbines (onshore and off) and the cost of residential electricity there is about 36¢/KWH. The U.S. average residential cost is about 12¢/KWH. How is it good for our citizens or our economy—our families, farms, factories, hospitals, schools and all businesses—to increase our cost of electricity by three times?

According to the U.S. Energy Information Administration all renewables together currently provide about 5% of our country's Total Primary Energy Requirements (TPER). Wind and solar alone, provide less than 3% of the U.S. TPER, and less than 1% of global TPER.

Speculation that expensive, uncontrolled renewable energy will completely replace low-cost, reliable fossil fuel energy sources, is simply wishful thinking, and without scientific basis. The only reason wind and solar have become even a small part of the energy mix, is because of the effectiveness of an intensive lobbying campaign to influence political policies (e.g. to get tax dollars for products that are not cost effective on their own). Despite their political support, wind and solar will continue to be relatively minor players for the foreseeable future.

12-To effectively combat climate change, oil and gas need to stay in the ground. Opponents of drilling claim we can contribute to the Paris Accord's goal (limiting the earth's temperature rise to no more than 2° C), by not using the fossil fuel resources off our coast. However, leaving these resources in the ground that wouldn't have been produced for another 15± years anyway, clearly won't have any near-term effects on climate change. Additionally, leaving these resources in the ground will not affect the U.S. demand, so the oil and gas we consume will come from other sources.

Once again, in making their anti-fossil fuel case, the drilling opponents are leaving out important information. For example, a detailed study was done at MIT to simulate some of the consequences of getting just 10% (a far cry from 100%) of our TPER from wind energy. The startling conclusion is: "using a three-dimensional climate model suggested that a large deployment of wind turbines over land to meet about 10% of predicted world energy needs in 2100 could lead to a **significant temperature increase** in the lower atmosphere over the installed regions." In other words, large-scale deployment of industrial wind turbines could **increase** climate temperatures!

Another claim frequently made, is that we need more wind energy so that we can get rid of coal. (This is primarily heard from the Sierra Club which has been paid $80 million to conduct its anti-coal campaign: see here and here.) The problem is that no quantity of wind turbines can ever replace even a single coal facility, as coal is typically a base-load source (i.e. one that generates a constant amount of electricity 24/7/365). Due to its unpredictable and uncontrolled output, wind energy can never provide base-load electricity. What can replace coal is a Wind+Gas package—*but that means continued fossil fuel dependence*.

An eye-opening pertinent study (confirmed here and here) compared the CO2 from the Wind+Gas package that actually exists on the grid, to the CO2 from just Gas by itself. Due to some technical realities (like the fact that there are two different types of Gas generators), **Gas by itself resulted in lower CO2 than Wind+Gas!** In other words, if the objective is to reduce CO2 (and help with Climate Change), we should be using **more Gas**, and **less Wind**!

Another consideration rarely heard from fossil fuel opponents is the use of Enhanced Gas Recovery (EGR). This technique amounts to injecting CO2 into the ocean subsurface, to force out the gas. This offshore energy CO2 sequestration would *help* with climate change.

In another climate change perspective, keeping Atlantic oil and gas in the ground could raise prices and suppress demand for these fuels. The higher natural gas prices would inhibit the use of this clean-burning bridge fuel, and limit its ability to substitute for coal and reduce CO2 emissions. This would unquestionably be the case in Europe, where Russian supplied natural gas is priced at 5± times what we pay. This high cost limits Europe's ability to substitute clean-burning natural gas for coal, which means that more global CO2 could be saved if we developed and exported our offshore natural gas to Europe.

Despite the religious opposition of certain environmental organizations to fossil fuels, the fact is that the global percentage of fossil fuel use has NOT decreased over the past **forty** (40±) years. Additionally, the official projections for the next **twenty-five** (25±) years are that the global percentage of fossil fuel use will INCREASE. Based on this reality, and the other careful explanations provided in this document, it's clear that we should embrace careful and cautious exploration and development of our offshore fossil fuel energy resources.

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Some Conclusions:

a) Offshore wind energy is a much worse choice than is offshore natural gas.

b) When the NGO concerns about offshore fossil fuel exploration and development are carefully and objectively examined, the evidence indicates that they are weak.

c) When the NGO concerns about offshore fossil fuel exploration and development are compared to their position on each of the same items regarding offshore wind energy, there are significant discrepancies. This inconsistency erodes their credibility.

d) On the other hand when the NGO concerns about offshore fossil fuel exploration and development are compared to the position of the Russians regarding U.S. energy policy, there is almost perfect alignment. This uniformity supports the contention that the NGO offshore fossil fuel concerns are primarily political in nature.

e) Strategically, DOI would be well-advised to change their current OCS Leasing Plan from Natural Gas and Oil to just Natural Gas.

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Some sample U.S. offshore drilling articles and reports:

BOEM Environmental Assessment of the OCS Oil and Gas Leasing Program

Offshore Resources: Digging Up The Facts

OCS Leasing Benefits

Sound and Marine Seismic Surveys

Interview re Seismic Testing

Offshore Access to Oil and Natural Gas Resources

Some sample NC offshore drilling articles and reports:

NC DENR Presentation about Offshore Wind and Fossil Fuels (2016)

Offshore Energy Primer (one page)

Pine Knoll Shores Talk (Rudi Rudolph)

Differences Between Friends and Foes of Offshore Drilling

Drilling Opponents Pack Raleigh Meeting (also see sidebar article)

**John Droz, Jr. is an independent physicist, an internationally known energy expert, and founder of Alliance for Wise Energy Decisions (AWED). For over 40 years John has also been an ardent environmental advocate, and had been an active member of multiple environmental organizations (e.g. the Sierra Club). During this period he has never received funding from anyone. He and his wife reside on the NC coast. The views expressed here are his own.*

This paper is a significant expansion of the excellent offshore energy report originally done by John Brodman. He was a former (retired) Deputy Assistant Secretary for International Energy Policy at the U.S. Department of Energy, and former member of the NC Energy Policy Council. Special thanks also to the many people who took the time to review this paper.

[LIST OF DOCUMENTS SUBMITTED FOR THE RECORD RETAINED IN THE COMMITTEE'S OFFICIAL FILES]

— International Fund for Animal Welfare (IFAW): Statement of Ms. Beth Allgood, U.S. Country Director.

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